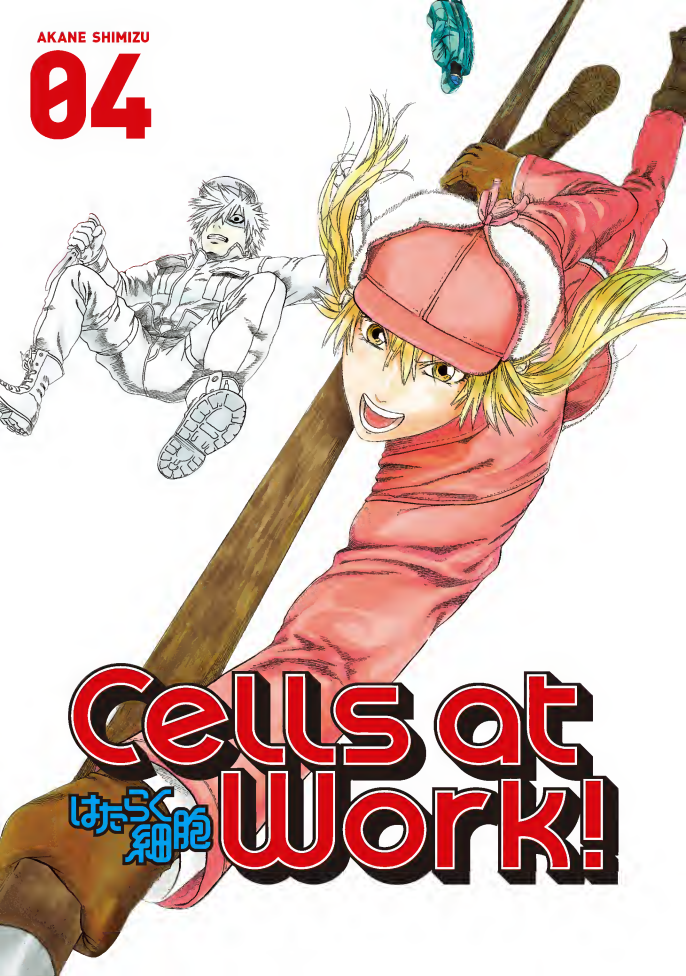


AKANE SHIMIZU

04

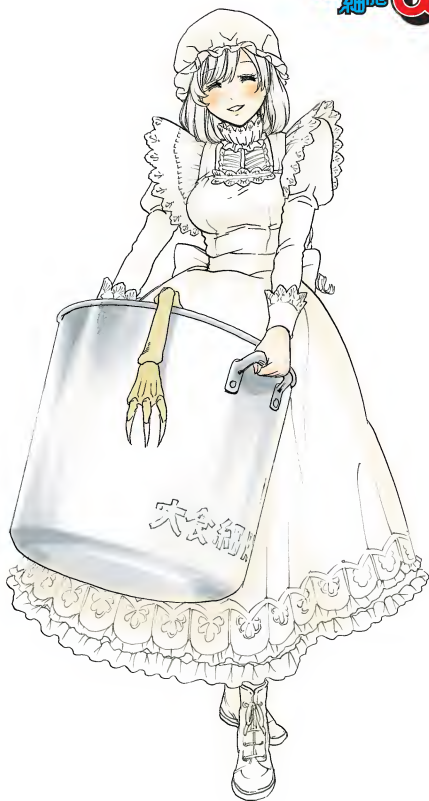


Cells at Work!

はたらく細胞

Cells at Work!

はたらく細胞



04

AKANE SHIMIZU

04

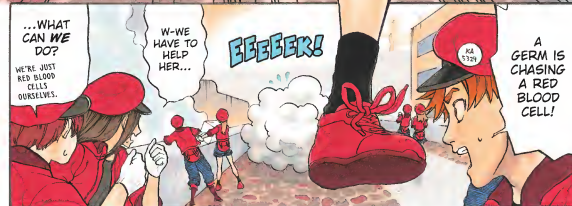
Cells at Work!

AKANE SHIMIZU

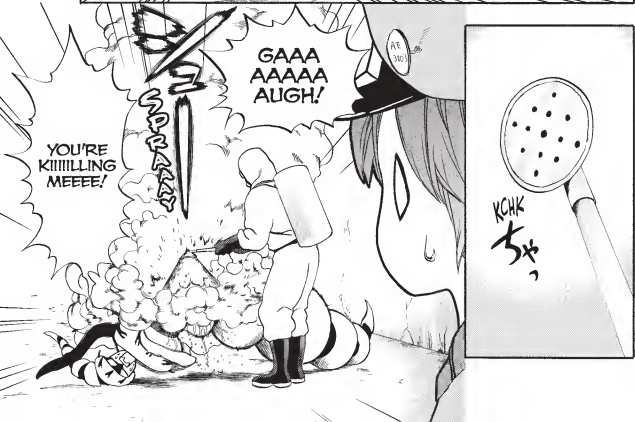
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Chapter 17	Hypovolemic Shock (Part I)	067
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PANT!
PANT!

TH-
THANK
YOU FOR
SAVING
ME...

HOHHH...
KSHHH...

NICE.

CHAPTER 15: STAPHYLOCOCCUS AUREUS





White Blood Cell (Neutrophil)

His main job is to destroy foreign substances that enter the body from the outside, such as bacteria and viruses. Neutrophils make up more than half of the white blood cells in the blood.



OH, THAT'S
MONOCYTE.

MONO...
CYTE?

Monocyte

A mononuclear, transigrating cell that makes up about 7% of all white blood cells. Like other immune cells, it works to protect the body.

YUP. THEY'RE
ANOTHER IMMUNE
CELL WORKING
IN THE BLOOD
STREAM. WE
WORK TOGETHER
SOMETIMES.



HUH?

WHAT
THE--?!
OH, RED
BLOOD
CELL.

WAS
THE
ANTIGEN
KILLED
ALREADY
?

UH...
Y-YES.



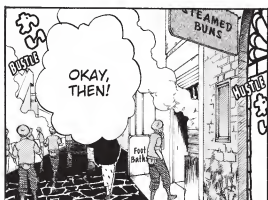
WHAT
KIND OF
CELL
ARE
THEY?

THAT
PERSON
IN THE
MASK
TOOK
CARE
OF IT.



Phagocytosis
The process by which a cell engulfs and breaks down bacteria and foreign substances.

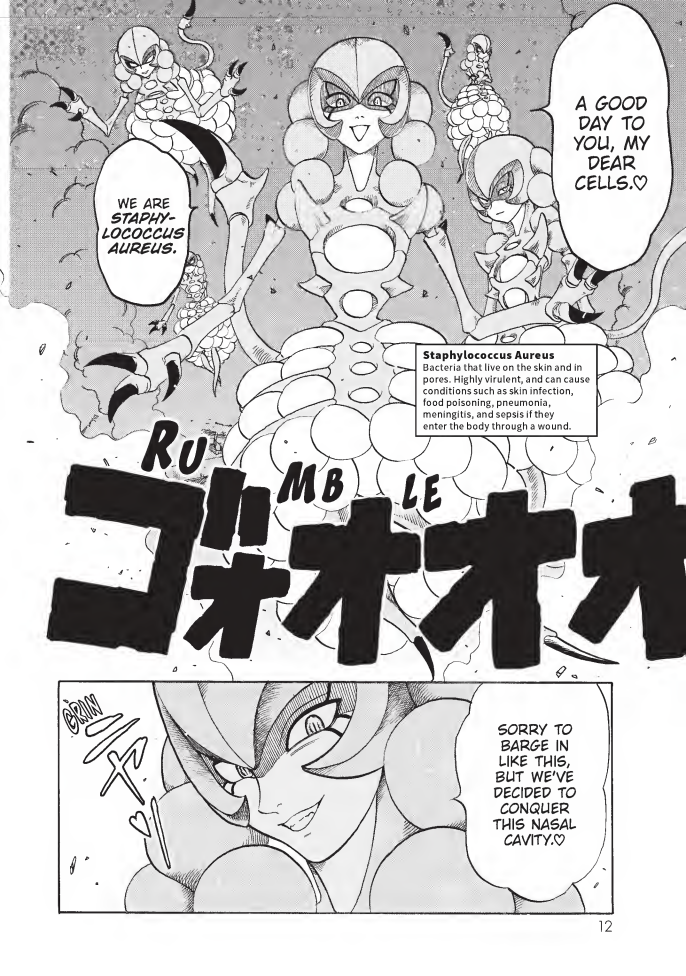
...BUT THEY'RE VERY VIGOROUS IN BOTH PHAGOCY- TOSIS AND TRANS- MIGRATION. THERE'S NOT MANY OF THEM IN THE BLOOD...



Transmigration
The act of moving freely inside an organ.







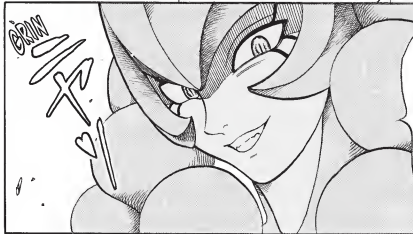
WE ARE
**STAPHY-
LOCOCCLUS
AUREUS.**

A GOOD
DAY TO
YOU, MY
DEAR
CELLS.♡

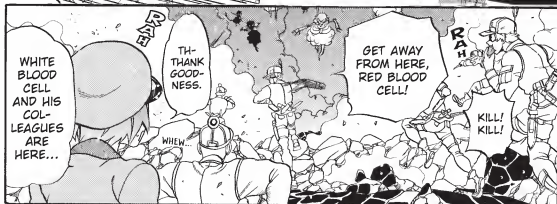
Staphylococcus Aureus

Bacteria that live on the skin and in pores. Highly virulent, and can cause conditions such as skin infection, food poisoning, pneumonia, meningitis, and sepsis if they enter the body through a wound.

RUMBLE
コオオオオオ

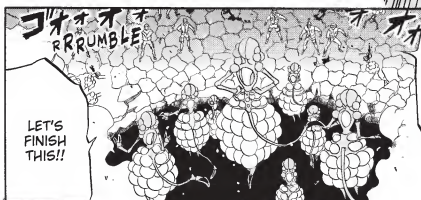


SORRY TO
BARGE IN
LIKE THIS,
BUT WE'VE
DECIDED TO
CONQUER
THIS NASAL
CAVITY.♡





DIE,
GERMS!



LOOK!
THAT'S
ALL
THAT'S
LEFT OF
THEM.





AH HA
HA HA
HA HA
HA!

BOOM

TRY A
TASTE
OF THE
NEW
ME!



SHE
PULLED A
NET FROM
UNDER
THE
GROUND—
WAIT,
THAT'S
NO NET—

WHY,
YOU—

SHE
KNOCK-
ED US
BACK?!

YOU
RECOGNIZE
THIS, DON'T
YOU?

THAT'S
RIGHT, IT'S
FIBRIN.

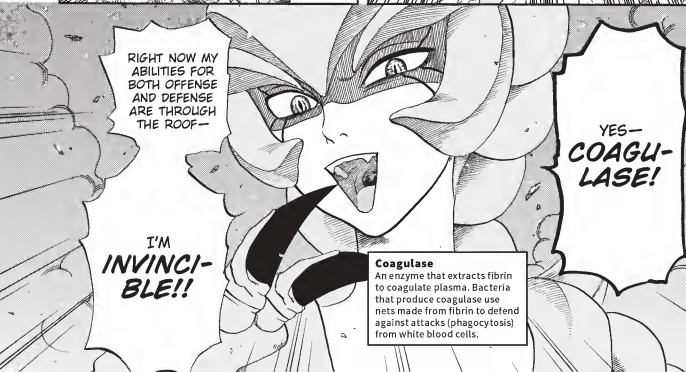
OH,
SHOOT—

THIS
IS
BAD...

...?!

Fibrin

A protein involved in the
coagulation of blood.

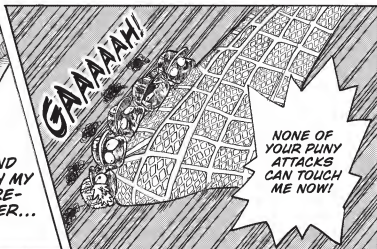


Coagulase

An enzyme that extracts fibrin to coagulate plasma. Bacteria that produce coagulase use nets made from fibrin to defend against attacks (phagocytosis) from white blood cells.



AND
WITH MY
FIRE-
POWER...



NONE OF
YOUR PUNY
ATTACKS
CAN TOUCH
ME NOW!



...I'LL
FINISH
YOU ALL
OFF!!

KA

BOOM

GAAAAAH!



WHAT
HAP-
PENED
TO THE
WHITE
BLOOD
CELLS...?

COUGH!
COUGH!

RRRUMBLE

ドドドド

MY,
DOES
THAT
FEEL
GOOD.



SILENCE

AHHH
HA HA
HA HA!



YOU
CAN'T
EVEN
LAY A
FINGER
ON ME.

I SEE
YOUR FEET,
THOUGH!
AH HA HA
HA HA!



НАН
 НА
 НА
 НА
 НА!

TWITCH



SILENCE

TWITCH

WAKE UP!
SHE'LL
KILL YOU!

NO!
WHITE
BLOOD
CELL!

**I'LL TEAR
THESE
NEUTRO-
PHILS...**

**...TO
PIECES!**

?!



FREE!

ガラガラガラ
CRUMBLE CRUMBLE
CRUMBLE

HOH...
KSHHH...

LOOM

ISN'T
THAT...?!

OH!

AE
3805

WH-
WHAT
ARE
YOU?!

TEE
HEE!



WE'RE
OUTSIDE
THE
BLOOD
VESSEL
NOW!

MY,
MY.

KTCH
+

OH.



O K A A Y !

ト
ト
ト
RATTLE

ト
ト
ト
RATTLE

EVERYONE!♡
LET'S CHANGE
OUT OF
THESE!

HUH?

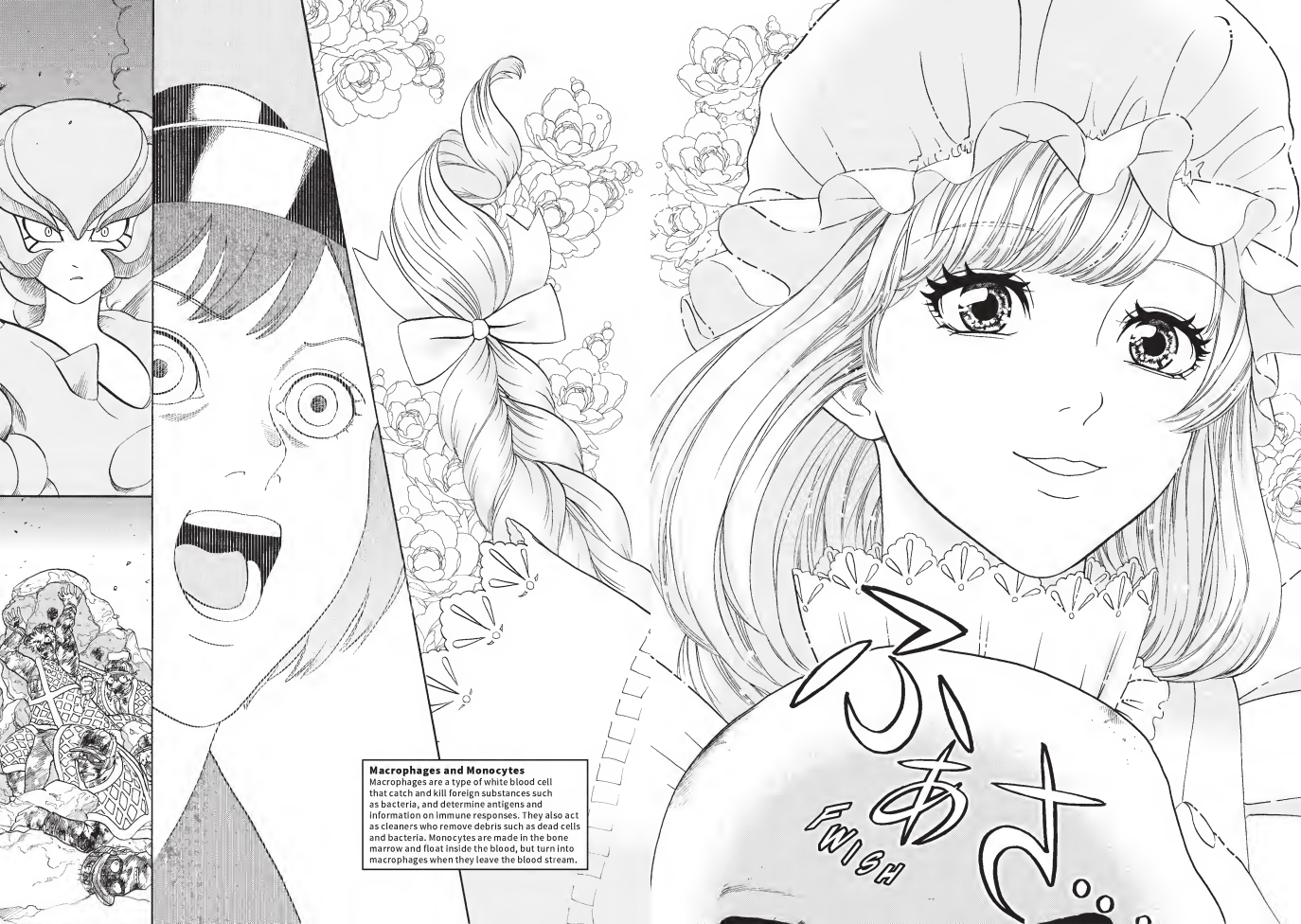


I KNOW...
THAT
VOICE...?

I—

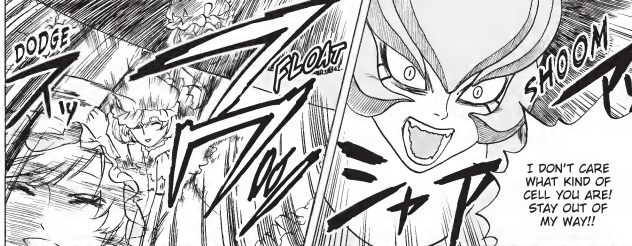
I—





Macrophages and Monocytes

Macrophages are a type of white blood cell that catch and kill foreign substances such as bacteria, and determine antigens and information on immune responses. They also act as cleaners who remove debris such as dead cells and bacteria. Monocytes are made in the bone marrow and float inside the blood, but turn into macrophages when they leave the blood stream.



COULD
THESE BE
THE MACRO-
PHAGES...?!

ズ
CROWD
3

ズ
CROWD
3

I-IT CAN'T
BE... CELLS
WITH BLUNT
WEAPONS...
AND SO
STRONG...

YAAAH!

DON'T
YOU
LAUGH
AT US!

AREN'T
MACRO-
PHAGES
THE
REALLY
STRONG
ONES?
NO WAY,
I'M
OUTTA
HERE.

WHAT,
AT A
TIME LIKE
THIS?!!

NOW,
LADIES—

WHAT'S
THIS,
DISCORD
IN YOUR
RANKS?



GAUGH!

KA

BLAM

LET'S
OVER-
POWER
THE
ENEMY!
♡



AH HA HA HA! ♥

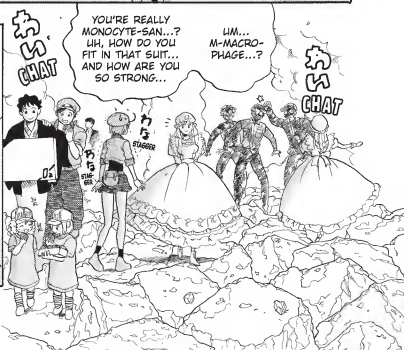
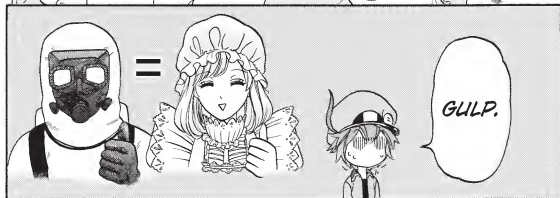
TEE HEE ♥

THUMBS UP! ♥

BUT I'M
SO GLAD
WE COULD
BE OF
HELP! ♥

NICE
グ
ッ

AWWW,
WE'RE ONLY
SUPPOSED
TO DO THAT
WHEN WE'RE
MONOCYTES!



TEE
HEE!



EVERY
GIRL HAS
A SECRET
OR TWO.



CHAT

MACRO-
PHAGE
TAKES
ON MANY
FACES AND
ROLES.

AH HA HA
HEE HEE

NURSERY
SCHOOL
TEACHERS,
CLEANERS,
AND
KILLERS...

CHAT

SOMETIMES
GENTLE,
SOMETIMES
FIERCE...

AH HA HA

EH, IT
HAPPENS.

MAN, WE
REALLY GOT
ROASTED
THIS
TIME.

CHAPTER 15: END

NASAL CAVITIES

THE LAND OF STEAM

Nasal cavities are the entrance of the respiratory system. They warm and moisten the air entering the body in order to protect the delicate alveoli from damage.

WHERE
WARM AIR
FILLS
YOUR
BODY

NASAL CAVITIES,
THE LAND OF STEAM...
IT SAYS HERE WE CAN
RELAX AND REFRESH THE
MIND AND BODY!

000H.

PAMPHLET

OH... WANT ME TO
SHOW YOU AROUND?

DUDE, YOU NEED
TO FRESHEN UP BEFORE
YOU REFRESH!

Cells at
Work!
はたらく細胞



CHAPTER 16: DENGUE FEVER



Red Blood Cell

Her red color is due to the chemical hemoglobin. She transports oxygen and carbon dioxide through blood circulation.

HARMFUL
MATERIALS
DETECTED
NEAR THE
EPIDERMIS!

OH!

METAL DETECT!

THAT'S
NOT
GOOD!!

Mast Cell (Mastocyte)
Secretes chemicals such as histamine and leukotriene in response to stimulus from excessive amounts of Immunoglobulin E.

...TO
ABOUT
HERE.

CLICK
CLICK

CLICK
CLICK

LET'S
SEE...
I'M
SUPPOSED
TO LET
OUT THIS
MUCH, SO
I SHOULD
TURN THE
DIAL...

HARMFUL
MATERIALS
DETECTED IN
THIS AREA.
RELEASING
HISTAMINE.

WHOA,
YOU'RE
KIDDING...
HOLD UP!

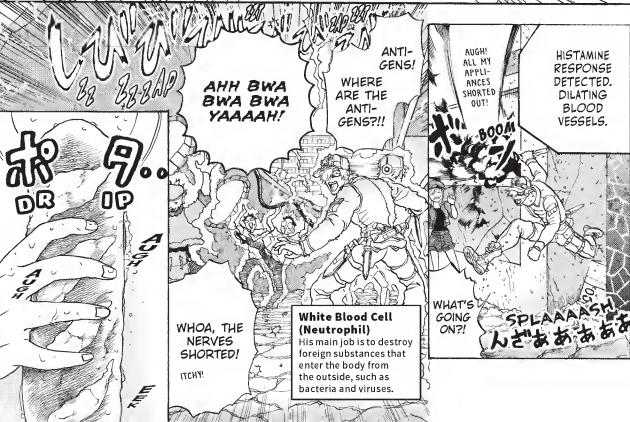
SO
SUDDEN!

CLAMOR
どよめき

TIME
TO EAT!

Histamine

A chemical mediator released by mast cells when they recognize foreign substances or damage to tissues. Histamine works to dilate vascular endothelial cells.



ANTI-GENS!

WHERE ARE THE ANTI-GENS?!!

AHH BWA BWA BWA YAAAAH!

AUGH! ALL MY APPLIANCES SHORTED OUT!

HISTAMINE RESPONSE DETECTED. DILATING BLOOD VESSELS.

WHAT'S GOING ON?!

White Blood Cell (Neutrophil)

His main job is to destroy foreign substances that enter the body from the outside, such as bacteria and viruses.

WHOA, THE NERVES SHORTED!

ITCHY!





E-
EXCUSE
ME?!

I REACTED
BECAUSE A
HARMFUL
SUBSTANCE
ENTERED THE
BODY! I DID
WHAT WAS
NECESSARY!!



YOU CAN'T
JUST
DUMP OUT
HISTAMINE
WITHOUT
THINKING!

IT'S A
HUGE
MESS
EVERY
TIME!!

SHORTING OUT
NERVES ITCHES
LIKE CRAZY



"MY JOB,
MY JOB!"
ALL YOU DO
IS CAUSE
TROUBLE
FOR
EVERYONE
ELSE!!

...IT'S
MY JOB,
YOU KNOW
!!

BUT
...

MRMR
ももも
3 STAMMER
STAMMER

EVERY-
ONE, CALM
DOWN..

HISTAMINE
PLAYS A
ROLE-

HEY, WAIT.

I BET
YOU JUST
OVER-
REACTED
OVER
NOTHING.

WHAT
HARMFUL
SUB-
STANCE?



SNAP

MAKING
MORE
WORK FOR
EVERYONE
ELSE...
YOU'RE
ALWAYS
SO...

...HYSTER-
ICAL!!



UH-
OH!





THAT'S
EXACTLY
WHAT I'M
TALKING
ABOUT!

WHOA!



SHE
ALWAYS
DOES
THIS.

GO AWAY!
GET OUT
OF MY
SIGHT, ALL
OF YOU!!

TSK...
LET'S GET
OUT OF
HERE.

...A
TROUBLE-
MAKER MAKING
WORK FOR
EVERYONE
ELSE! ALL
RIGHT THEN,
I WON'T DO
ANYTHING!!

FINE!
FINE!
SO I'M
JUST...

MAY
CELL,
PLEASE
CALM
DOWN!

AH, NO, I'M THE ONE WHO SHOULD APOLOGIZE.

I HAD SOMETHING ON MY MIND AND WASN'T LOOKING WHERE I WAS GOING...

S-
SORRY.

Langerhans Cell
A type of dendritic cell of the epidermis. They have two main roles: Signaling the brain when foreign substances, such as bacteria and viruses, enter the body, and protecting the skin against ultraviolet rays and dehydration. Not to be confused with the islets of Langerhans, which are cell clusters in the pancreas.

A type of dendritic cell of the epidermis. They have two main roles: Signaling the brain when foreign substances, such as bacteria and viruses, enter the body, and protecting the skin against ultraviolet rays and dehydration. Not to be confused with the islets of Langerhans, which are cell clusters in the pancreas.

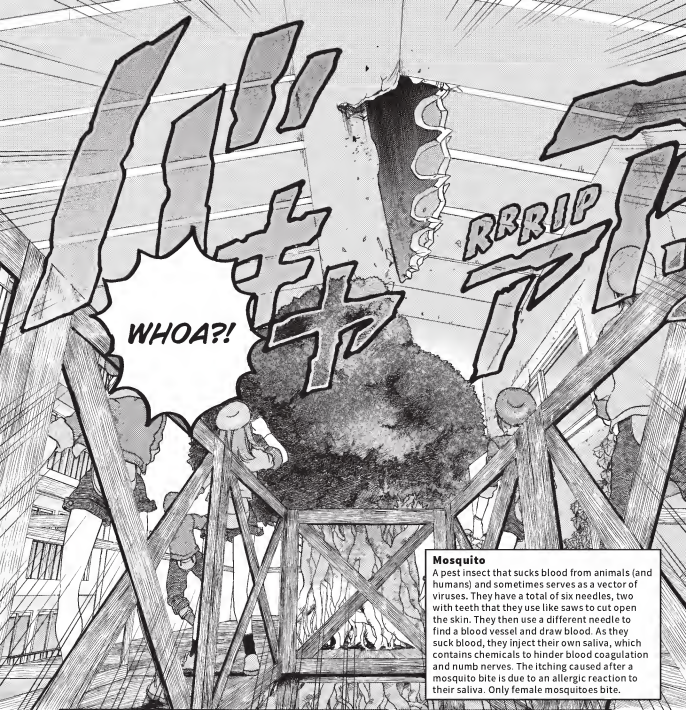
わい
BUSTLE

BUZZZZ

BUZZZZ

THAT'S RIGHT. I HAVE TO FOCUS ON MY OWN JOB...

HUUH?



Mosquito

A pest insect that sucks blood from animals (and humans) and sometimes serves as a vector of viruses. They have a total of six needles, two with teeth that they use like saws to cut open the skin. They then use a different needle to find a blood vessel and draw blood. As they suck blood, they inject their own saliva, which contains chemicals to hinder blood coagulation and numb nerves. The itching caused after a mosquito bite is due to an allergic reaction to their saliva. Only female mosquitoes bite.



Y3 GROSSY ン

I'M...
GETTING...
SLEEPY...
ZZZZ...

UH...
HUH...?

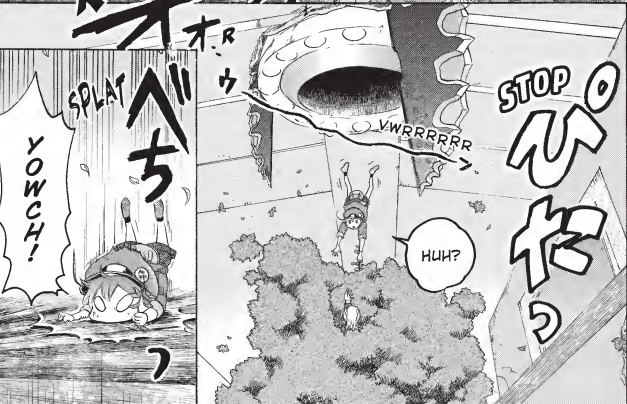
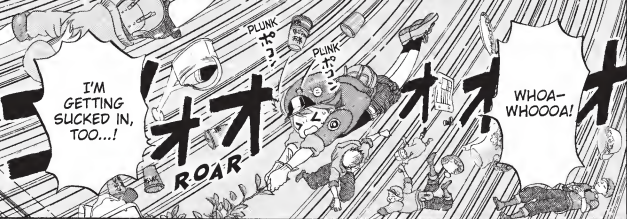


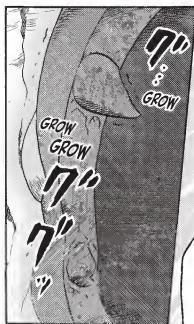
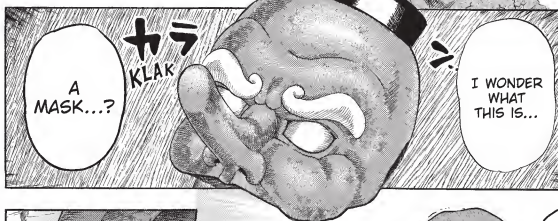
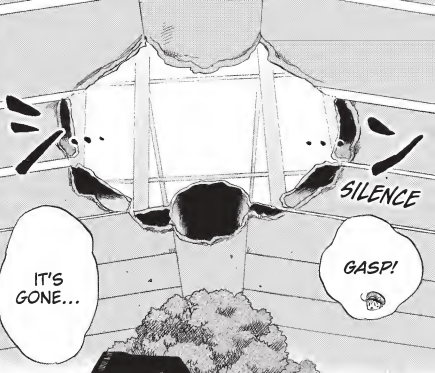
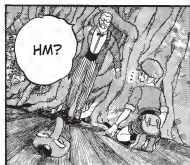
WHAAA?!

WH-
WH-

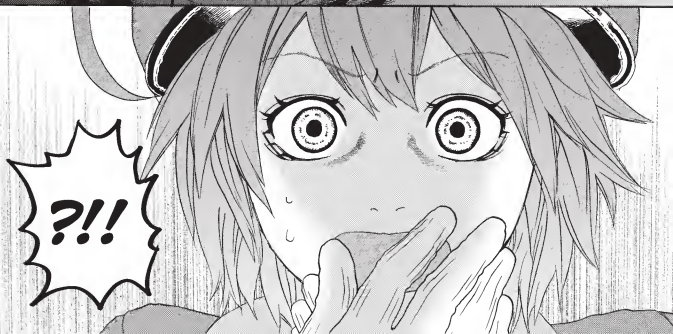
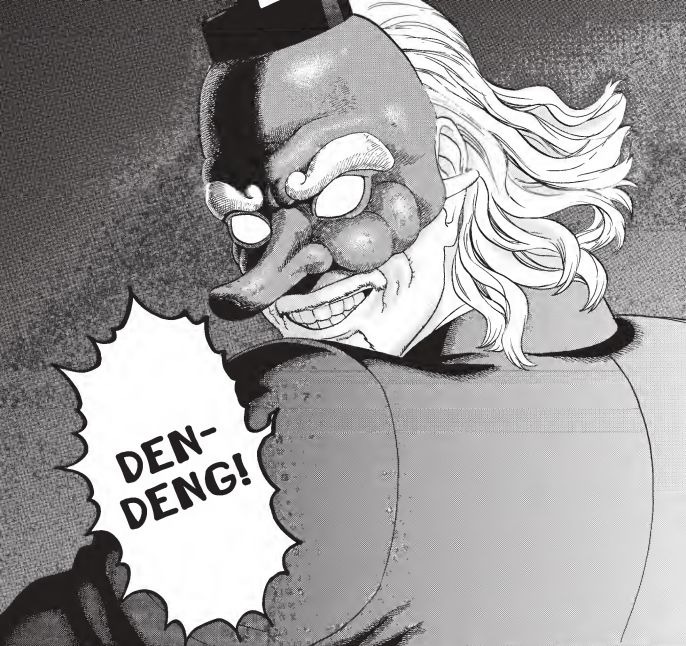


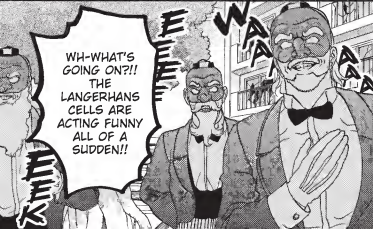
**ALL THE
BLOOD
CELLS ARE
GETTING
TAKEN?!!**









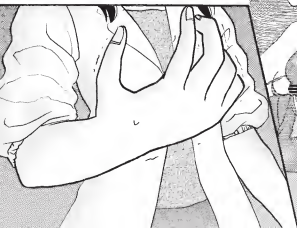
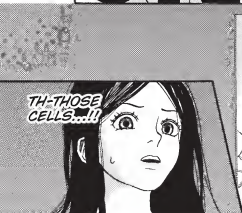
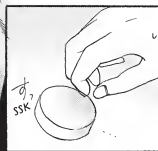
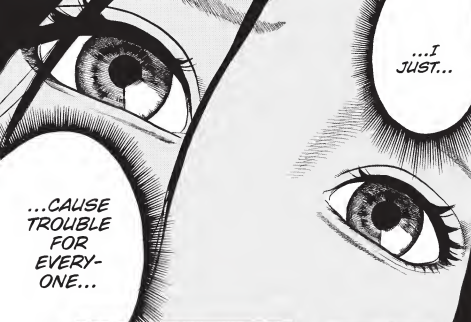






I HAVE TO
RELEASE
THE
HISTA-
MINE—





WHOA
!!!

FLASH

VERILY, YOU
ARE THE VERY
IMAGE OF A
MARIONETTE,
MADE TO
DANCE BY
THE WORDS
OF OTHERS
AND TANGLED
IN YOUR
STRINGS...

Basophil

A type of white blood cell. Basophils encountering specific antigens are said to trigger the release of histamine, as well as allergic reactions. The role that basophils play in the immune system is not yet fully understood.

Eosinophil

A type of white blood cell. Multiplies during allergic reactions and parasitic infections.

ARE YOU
TELLING
US TO
FOLLOW
OUR OWN
BELIEFS?!

THIS UNIVERSE,
IN WHICH ALL
THINGS MINGLE,
TRANSFORM, AND
FADE AWAY IS A
RAGING FLAME...
IT IS CHAOS
ITSELF... THIS
CATASTROPHE IS
BUT A MICRO-
COSM...

WH-WHY
IS THIS
ON THE
SCREEN
...?

WE ARE FRAGILE
LIFEFORMS WHO,
THROUGH OUR
INDEPENDENT
ACTIONS, FIND
MEANING IN OUR
EXISTENCE AND
FULFILL OUR
DUTIES—AND IN
DOING SO WE
COMPLETE
LIFE ITSELF...

BASO-
PHIL?!
WHO
ARE YOU
TALKING
TO?

IN THIS WORLD
OF UNCERTAINTY,
THERE IS ONLY
ONE THING THAT
EACH LIVING THING
CAN CONTROL
WITH CERTAINTY...
THAT IS ONE'S
OWN SELF
AND BEING...

BASOPHIL,
WHY ARE
YOU SAYING
THIS NOW?!

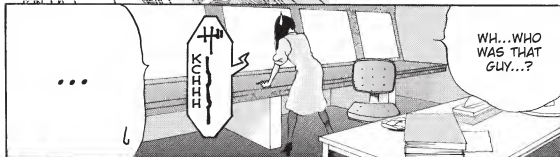


...LIES IN
THE DEMON-
STRATION
OF THAT
VERY SAME
EXISTEN-
GAAH!

BOOM

YOU MUST NOT
FORGET...THAT THE
REASON FOR OUR
EXISTENCE...

GAH,
WHO IS
THIS?!



...

KCHHH

WH...WHO
WAS THAT
GUY...?

GRIT
...

...!!

OH
NO,
OH
NO
NO

S-SOME-
BODY--!

ゴッゴッゴッゴッ
RRRUMBLE

WE'RE DONE
FOR IF THEY
DON'T SHOW
UP! SOMEONE
HELP US!!

DANG
IT, WHY
AREN'T
THE
IMMUNE
CELLS
HERE
YET?!

SOMEONE
HELP...

I
DON'T
CARE
WHO...

バニッ
US?!!

SPLASH





SIT
DOWN,
BE
QUIET...

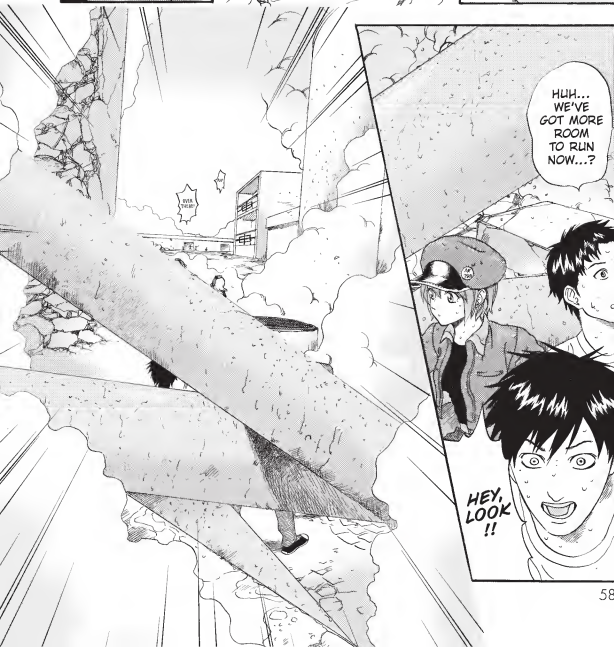
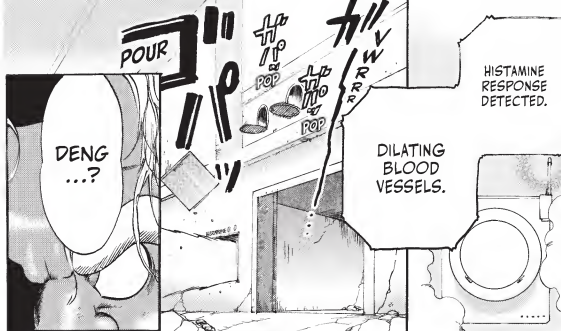
...AND
WATCH
ME
WORK!!

BLECH!
PFT!
PFFT!

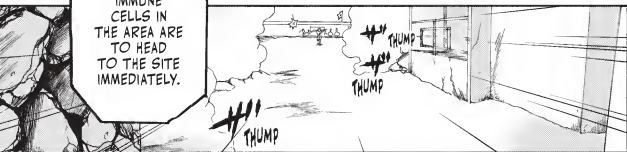
WAIT,
IS THIS
HISTA-
MINE?!

SHE'S
JUST PILING
ON TOP OF
THIS MESS!

IT'S THAT
MAST CELL
AGAIN!

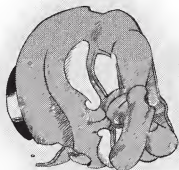


IMMUNE
CELLS IN
THE AREA ARE
TO HEAD
TO THE SITE
IMMEDIATELY.





THE INCIDENT
WAS CAUSED
BY THE VIRUS
INFILTRATING
WHEN A
MOSQUITO
DREW BLOOD
FROM
THE BODY.

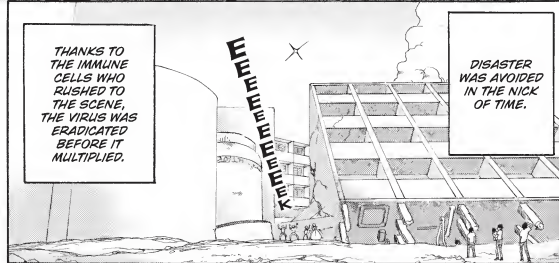


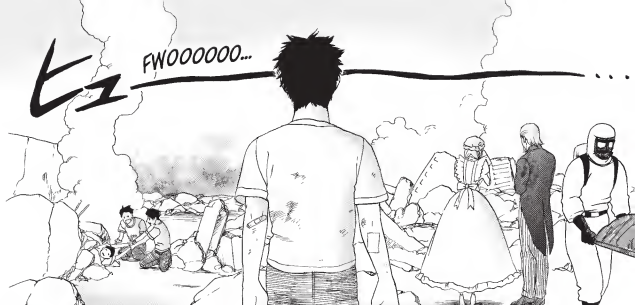
THE
ENEMY
TURNED
OUT TO
BE THE
DENGUE
VIRUS.

Dengue Virus

A virus spread by mosquitoes. Infection
can trigger Dengue fever, whose
symptoms include fever and headache.

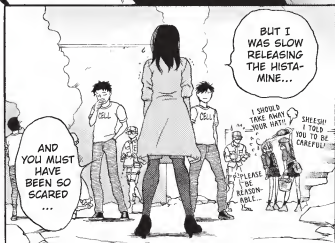
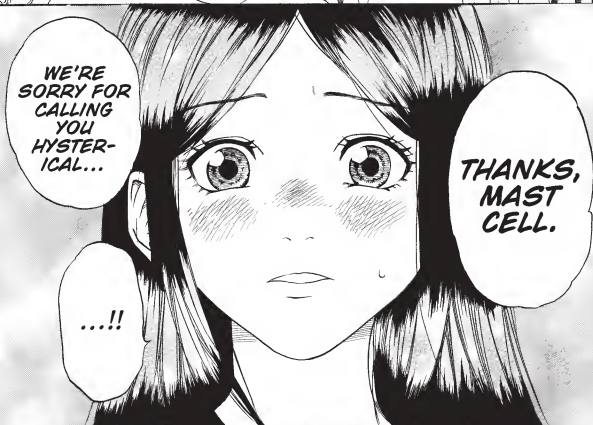
THANKS TO
THE IMMUNE
CELLS WHO
RUSHED TO
THE SCENE,
THE VIRUS WAS
ERADICATED
BEFORE IT
MULTIPLIED.





Inflammatory Response

Inflammation triggered by histamine and other chemicals causes signaling proteins called cytokines to attract white blood cells, and remove foreign substances. Inflammatory response is an indispensable biological defense mechanism.



BOOM

WAIT-

HAVEN'T I BEEN TELLING YOU ALL ALONG THAT I DIDN'T DO ANYTHING WRONG?!!

WHAA AAAAAA AAAT!?

BOOM

WAIT-

HAVEN'T I BEEN TELLING YOU ALL ALONG THAT I DIDN'T DO ANYTHING WRONG?!!

WHAA AAAAAA AAAT!?

BOOM

WAIT-

HAVEN'T I BEEN TELLING YOU ALL ALONG THAT I DIDN'T DO ANYTHING WRONG?!!

WHAA AAAAAA AAAT!?

HA HA

WHY ALLERGIC

HA!

SQUISH SQUISH

YES...

YOU'RE NOTHING BUT A PUBLIC NUISANCE!

THAT'S YOUR PROBLEM FOR OVER-REACTING!

WE TOLD YOU, THE HISTAMINE MAKES US ITCH!!

WHY SHOULD I APOLOGIZE?! THAT DOESN'T MAKE ANY SENSE! AND I ALMOST DID IT, TOO!

GODDAMN

GODDAMN

HA HA

WHY ALLERGIC

HA!

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WHY SHOULD I APOLOGIZE?! THAT DOESN'T MAKE ANY SENSE! AND I ALMOST DID IT, TOO!

GODDAMN

GODDAMN



Cells at
Work!
はたらく細胞

...TO
THE CELLS
IN THE
LIVER...

わ
わ
BUSTLE

OKAY,
NEXT UP-
I'M TAKING
THIS
OXYGEN...

わ
わ
BUSTLE

ニ
キ
パ
キ
EFFI
CIENT

OXYGEN GAS

Red Blood Cell

Her red color is due to the chemical hemoglobin. She transports oxygen and carbon dioxide through blood circulation.

...HMPH!

...

CHATTER
か
や

WH-
WHAT IS
IT...?

ガ
ガ
ガ
ガ
ガ

BUT I DO
HAVE A
FAVOR I
WANT TO
ASK YOU.

OH,
DON'T GIMME
THAT
FORMAL
STUFF.

IT'S ALL
THANKS
TO YOUR
DAILY GUID-
MHRRRMF!

むに
SQUISH

AW, SO
SOFT.

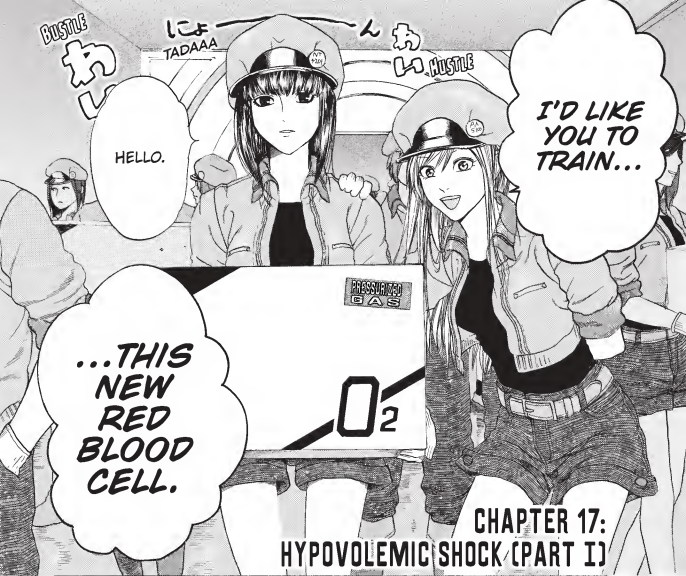
EVEN IF
YOU'RE
STILL A
KLUTZ.

YOU SEEM TO
BE GETTING
THE HANG
OF THINGS
LATELY.

OH,
DO YOU
REALLY
THINK
SO?!

CHATTER
か
や

CHAT
か
や





WHEN
YOU WERE
STARTING
OUT, DIDN'T
THE OTHER
RED BLOOD
CELLS SHOW
YOU THE
WAY?

SO THINK
OF IT AS
PAYING IT
FORWARD!

I DO THE
SAME
THING.

OH...

R-
RIGHT.



W-
WAIT,
SEN-
PAI!!

WELL,
GOOD
LU—



STOP
THAT!
THIS IS
A PART
OF
YOUR
JOB!!

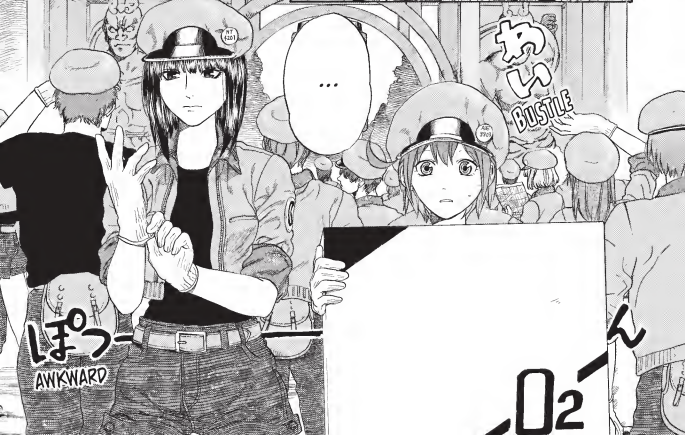
I-I
CAN'T.
I'M
BASI-
CALLY A
ROOKIE
MYSELF
...



Y-YES,
MA'AM
...

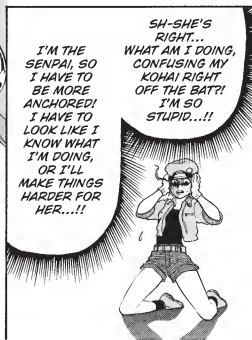
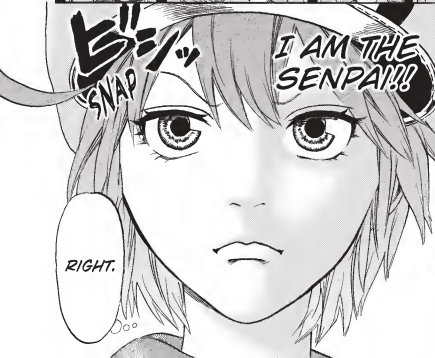
LET ME
KNOW IF
SOMETHING
COMES UP.

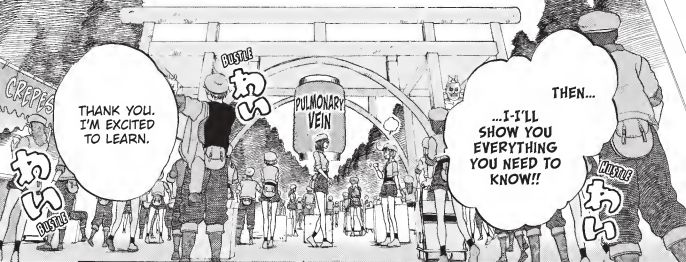
GOT IT?
NOW GET
TO KNOW
EACH
OTHER.



ANKWARD

02





THANK YOU.
I'M EXCITED
TO LEARN.

THEN...
...I'LL
SHOW YOU
EVERYTHING
YOU NEED TO
KNOW!!



AHEM.
LET'S
START BY
REVIEWING
OUR
DUTIES—

AH,
YES—



UM...
ER...
S—
SO...

UH...
LET ME...
GET MY
NOTES.

I LEARNED
THAT ONCE WE
DELIVER OXYGEN
TO VARIOUS ORGANS,
THE CELLS THERE
BURN GLUCOSE
TO CREATE ENERGY,
CARBON DIOXIDE,
AND WATER.

CARBON DIOXIDE
IS HARMFUL TO THE
BODY, SO IT NEEDS TO
BE EXPELLED. THAT'S
WHY WE CARRY IT TO THE
ALVEOLI AND EXCHANGE
IT FOR OXYGEN. I WAS
TAUGHT THAT OUR JOB
IS TO REPEAT THIS
PROCESS, ALTHOUGH
WE ALSO TRANSPORT
NUTRIENTS ON
THE SIDE.

OF THESE,
THE CHIEF
RESPONSIBILITY
FOR US RED
BLOOD CELLS
IS GAS
EXCHANGE,
ISN'T IT?

THE ROLES
OF BLOOD:
①WATER
RETENTION,
②GAS EXCHANGE,
③TRANSPORTATION
OF NUTRIENTS,
④THERMO-
REGULATION,
⑤DEFENDING
THE BODY, AND
⑥REPAIRING
WOUNDS.



NO—
THIS
WOMAN
...?

WHAT
AM I
SUP-
POSED
TO
TEACH
THIS
GIRL...?

AND SO WE
RED BLOOD
CELLS PLAY AN
ESSENTIAL ROLE
IN MAINTAINING
BIOLOGICAL
ACTIVITY THROUGH-
OUT THE BODY.
I'M SO HONORED
TO BE ABLE TO DO
SUCH IMPORTANT
WORK.

THAT...
SOUNDS
GOOD.

JUST
DO YOUR
BEST!!

THEN
LET'S START
BY ACTUALLY
CIRCULATING.
EVEN IF THERE
ARE THINGS YOU
DON'T KNOW AT
FIRST, IF YOU
WORK HARD,
YOU'LL GET IT
EVENTUALLY!!

OH, SO
YOU
ALREADY
HAVE
ALL THAT
DOWN.

MAYBE
THAT
WAY?

UH, SO
NOW WE
TURN...
RIGHT?

...TALK
ABOUT
NOW?

OH? SO
WHAT
SHOULD
WE...

ABOUT
OUR-
SELVES?

Killer T Cells

(Cytotoxic T Cells)

Professional killers who destroy
virus-infected cells, cancer
cells, and others. They are found
primarily in the lymphatic system.

YO!!
THIS IS
A LYMPH
DUCT!!
AIN'T NO
PLACE FOR
RED BLOOD
CELL
BRATS!!

M-MY
MIS-
TAKE
!!!

E E E E K !!

SHE'S
NOT
EXACTLY
GREAT
AT THIS...

SHE
SHOULD
HAVE
SAVED
THE
EXPLA-
NATION
OF THE
JOB
FOR THE
ROAD.

S
I
L
E
N
C
E



HM?

GETTING
YELLED AT
LIKE THAT
ISN'T PART
OF OUR
JOB, YOU
KNOW.

I JUST
THINK THAT
PERSON DIDN'T
NEED TO BE SO
AGGRESSIVE,
AND THAT
DOES BOTHER
ME A BIT...

...?
UH...
SURE, I
MEAN...

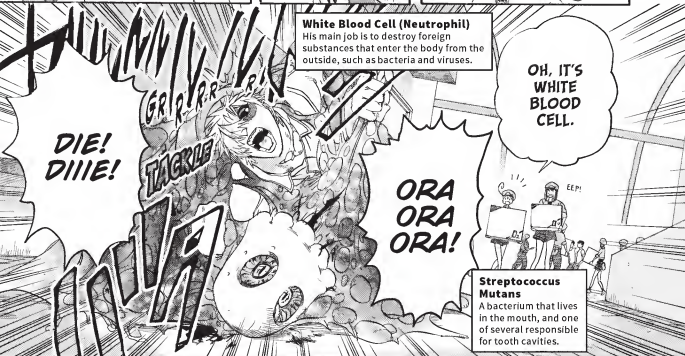


BOY,
THAT WAS
SCARY...
SORRY TO
PUT YOU
THROUGH
THAT.

OH...
IT'S
FINE.

I MAKE
MISTAKES
LIKE THAT
A LOT.

I'M SUCH A
DUMM...!



DIE!
DIE!

TACKLE

ORA
ORA
ORA!

OH, IT'S
WHITE
BLOOD
CELL.

Streptococcus Mutans

A bacterium that lives
in the mouth, and one
of several responsible
for tooth cavities.



SCREE!
SCREE!

HUH...?!
SENPAI,
YOU KNOW
AN IMMUNE
CELL?

MM-HMM.
THEY'RE
ALL GOOD
PEOPLE!

WHAT ARE YOU
TALKING ABOUT...?
NEUTROPHILS
CONFLATE JUSTICE
WITH VIOLENCE.
THEY'RE WALKING
CONTRADICTIONS.



TH-THAT'S
NOT TRUE!
IF YOU TALK
TO THEM,
YOU'LL SEE
THEY'RE
PERFECTLY
NICE AND—

SSSSS!
GRRRR...

HAAH!
HAAH!

HUFF!
HAAH!
HAAH!



GAH!
IT'S
STILL
ALIVE
?!

I SEE.
NICE TO
MEET
Y—



DIDN'T
FINISH
WHAT
SHE WAS
SAYING...

YOU,
TOO!

HEY,
RED
BLOOD
CELL.

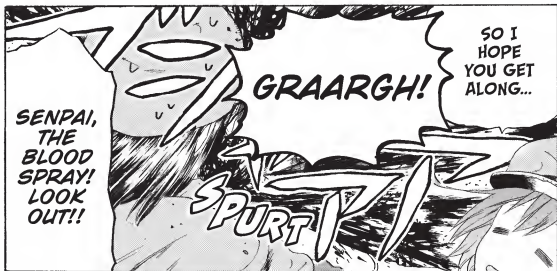
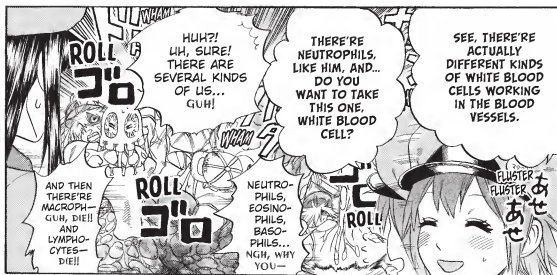
THANK
YOU FOR
YOUR
SERVICE,
WHITE
BLOOD
CELL.



I WAS
ENTRUSTED
WITH HER
TRAINING,
SO I'M
SHOWING
HER THE
ROPES!
THOUGH I
HAVEN'T
SHOWN HER
ANYTHING
YET...

HM?
WHO'S THE
RED BLOOD
CELL
WITH YOU?
A KOHA?!

SHE
IS!



WE GOT STICKY
BACTERIA BLOOD
ALL OVER YOUR
BRAND-NEW
UNIFORM...

NO...
IT'S
FINE,
REALLY.

SPLAAAAASH

**SORRY!
I'M SO
SORRY!!**

I FEEL
TERRI-
BLE...

**OH NO...
I HAVE TO
SHOW HER
THAT I CAN
BE A
SENPAI!!**

I KNOW.
I THINK
WE SHOULD
DO IT
QUICKLY.

SO NOW,
WE GIVE THIS
OXYGEN WE
CARRIED FROM
THE LUNGS
TO—

OH,
Y-YOU
THINK
SO?!

**LET'S
SIT AND
SIP AND
WARM
UP...**

I'VE GOT
SUGAR
AND
MILK,
TOO.

DO YOU
WANT
COFFEE
OR TEA?

**YOU GOT
ALL WET,
SO I
BROUGHT
SOME HOT
DRINKS.**

PERIOD
CALEN

YOU'RE
ABSOLU-
TELY
CORRECT.

**DON'T
YOU
THINK A
TOWEL
WOULD
BE
MORE
HELPFUL
THAN
TEA
RIGHT
NOW?**

JUST
HAND IT
OVER
ALREADY!!

SLAM!

YEAH,
YEAH!

I
KNOW
THAT,
TOO...

NOW, WHEN
YOU DELIVER
IT, YOU
SHOULD LOOK
THE PERSON IN
THE EYE WITH
A SMILE, AND
SAY IN A CLEAR
VOICE THAT YOU
BROUGHT THE
OXYGEN—

THANKS FOR
HELPING!

THE LITTLE
PLATELETS'
JOB IS TO
MAKE BLOOD
CLOT...OH?

Eosinophil

A type of white blood
cell. Multiplies during
allergic reactions and
parasitic infections.

DON'T
GET
CAUGHT
IN THE
FIBRIN!!

Platelets

When blood vessels are
damaged, they gather
to seal the wound and
stop the bleeding.

SENPAI,
YOU'RE
MAKING
HER UN-
COMFORT-
ABLE.

D-DON'T
MAKE SUCH A
BIG DEAL OUT
OF ME!! C'MON,
QUIT IT....!!

HOW
AMAZING,
YOU ASK?
SHE
BEAT A
REALLY
BIG
ENEMY
CALLED A
PARASITIC
WORM—

SENPAI,
I DON'T
THINK
THAT'S
THE
RIGHT WAY.

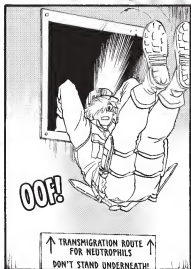
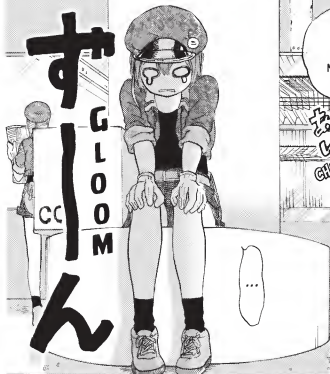
SENPAI,
THAT
DOESN'T
SOUND
RIGHT!

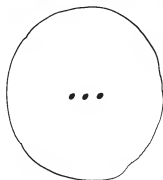
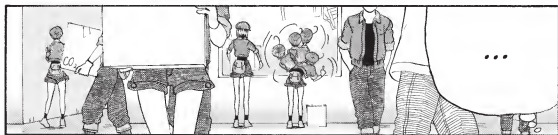
SENPAI,
YOU'RE
STANDING
IN THE
WAY!

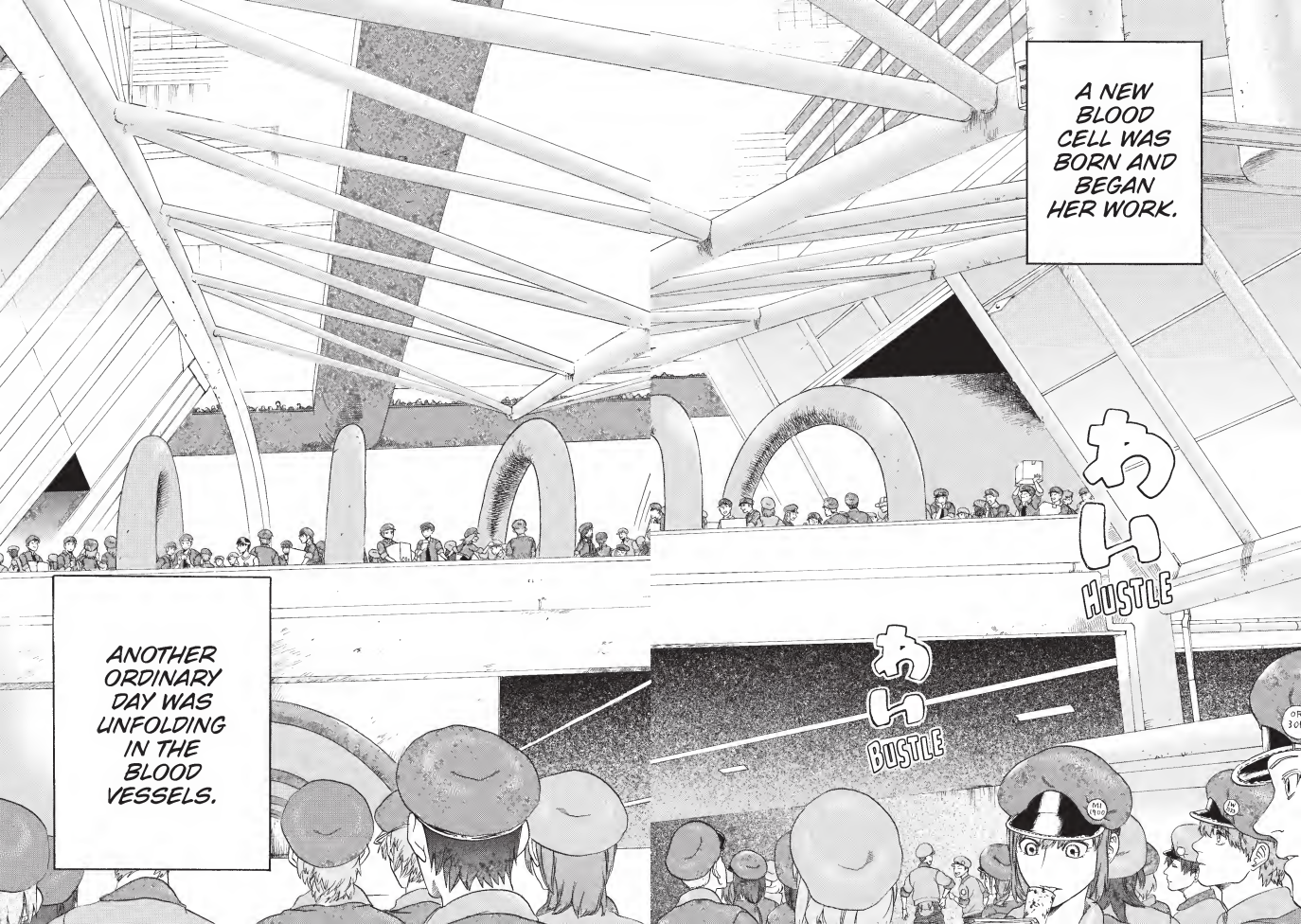
SENPAI,
I GET IT
ALREADY.

SEN-
PAI!

SENPAI,
PLEASE
CALM DOWN.





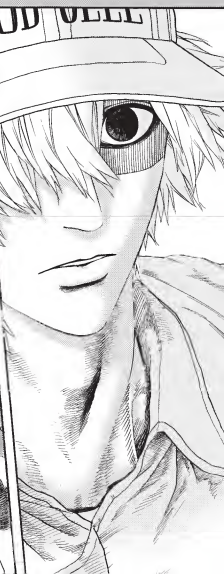
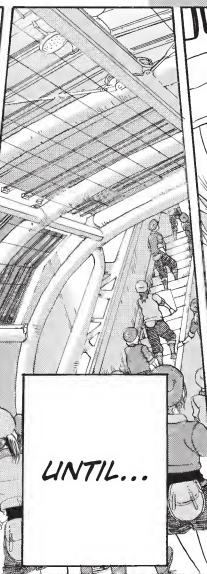
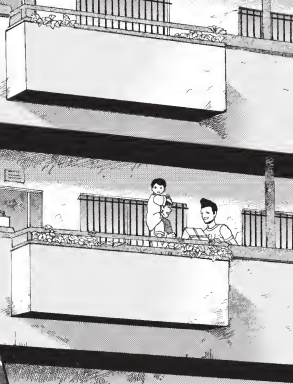


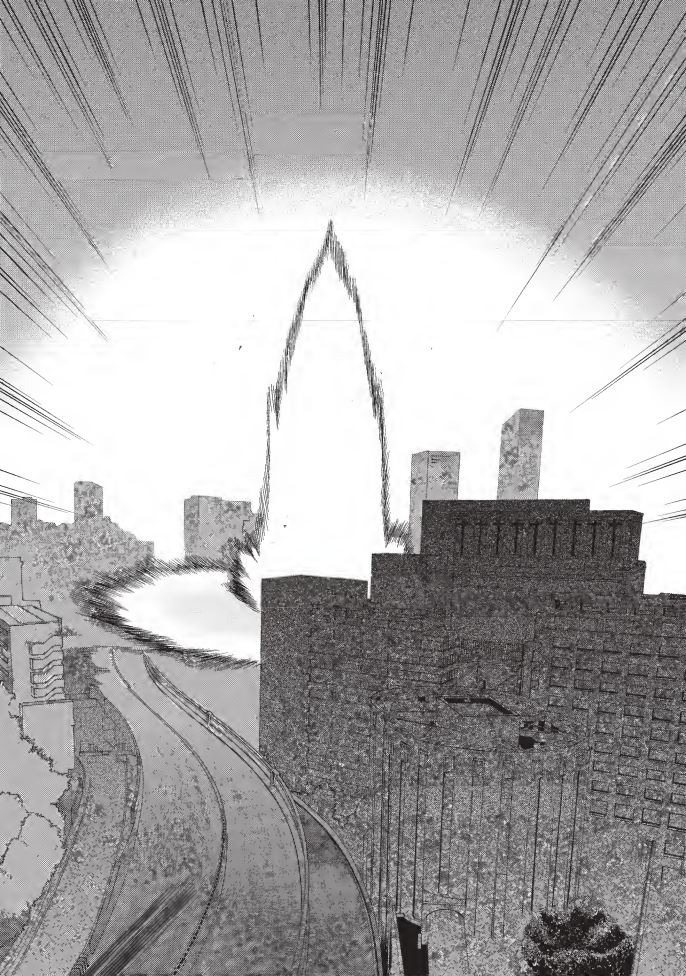
A NEW
BLOOD
CELL WAS
BORN AND
BEGAN
HER WORK.

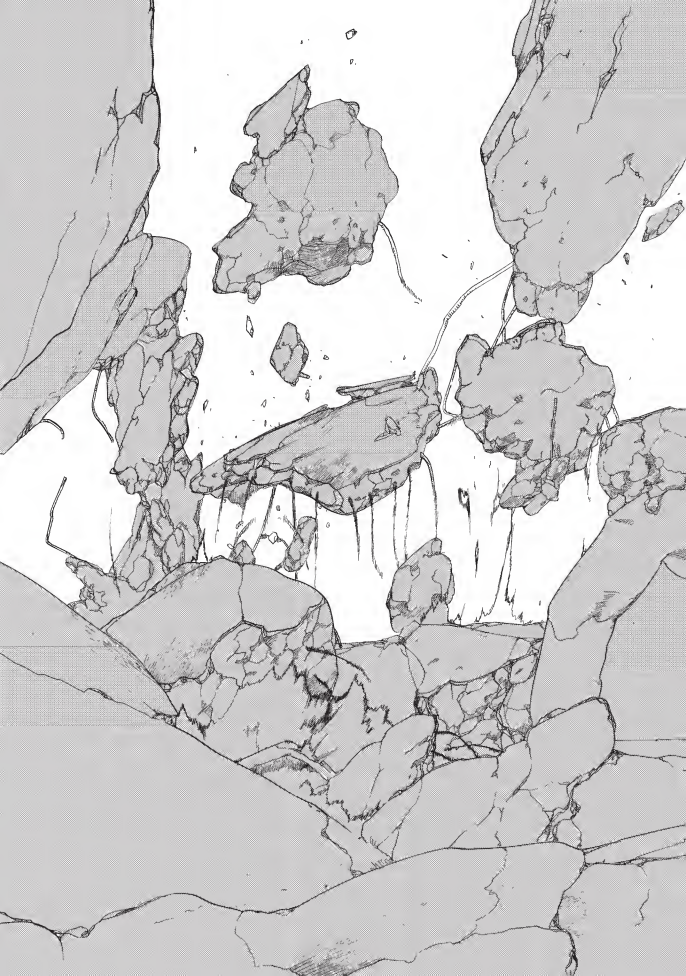
ANOTHER
ORDINARY
DAY WAS
UNFOLDING
IN THE
BLOOD
VESSELS.

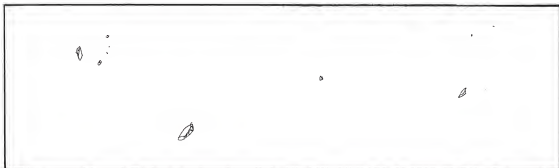
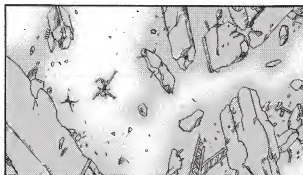
あ
い
BUSTLE

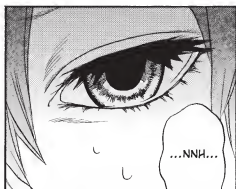
あ
い
BUSTLE









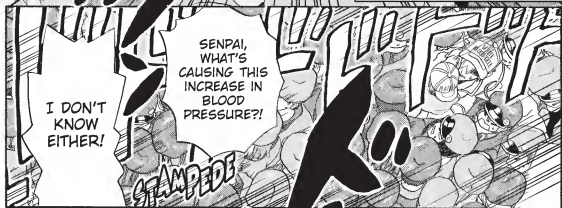






Blood Pressure

Pressure that is used to send blood to every corner of the body. Usually, the term "blood pressure" refers to the pressure inside the arteries. It is maintained by energy from the heart, which repeats contractions and expansions. Blood pressure can change due to a variety of causes. Hypertension (higher blood pressure than normal) and hypotension (lower than normal) can have a multitude of effects on the body.



STOP
PUSHING!

PLEASE STAND BY

PLEASE STAND BY

WHAT IS
THIS?!
WHAT'S
HAPPEN-
ING?!

BA-
DMP

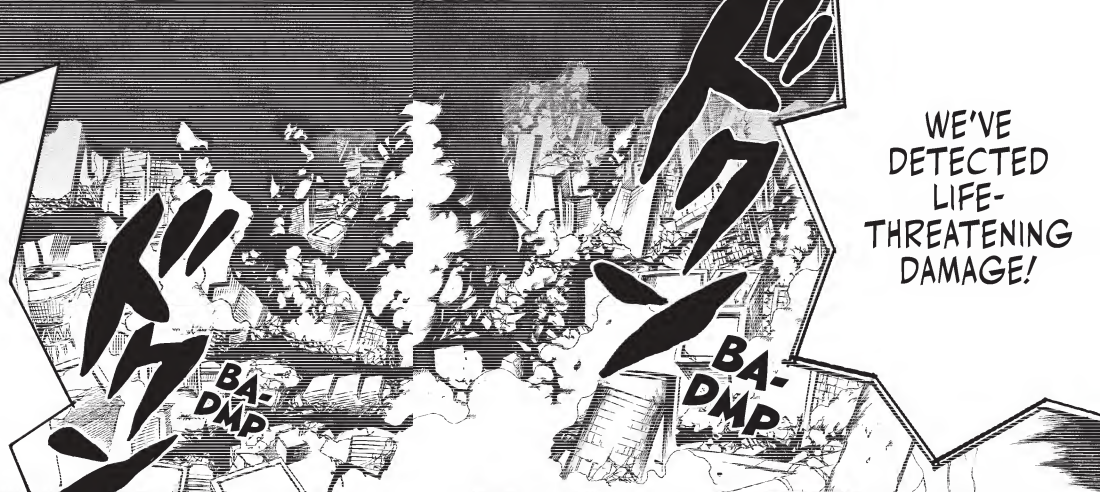
BA-
DMP

One corner of
the body's core

EMERGENCY

BEEEEEP
BEEEEEP

TISSUES
AND BLOOD
VESSELS
NEAR THE
HEAD HAVE
BEEN
SEVERELY
INJURED!



WE'VE
DETECTED
LIFE-
THREATENING
DAMAGE!



RED BLOOD
CELLS ARE
TO CONTINUE
CARRYING
OXYGEN FOR
HOMEOSTASIS!

OKAY,
LET'S DO
THIS!

THAT
WAY!

HUUH...?
WHAT'S
HAP--

LET'S
GO!

WHAT
...?



PLATELETS
ARE TO GATHER
PROMPTLY AT
THE DAMAGED
SECTIONS TO
STOP THE
BLEEDING!

IMMUNE CELLS
ARE TO DEPLOY
IMMEDIATELY TO
THE INJURY SITE
TO PREPARE
FOR INVADING
BACTERIA.

ALL RIGHT,
LET'S
GOOOOOO!!

EXCUSE
US!
PLEASE
CLEAR
THE
WAY!

RIGHT
NOW,
WE'RE
GOING TO
CARRY
OXYGEN!!

WE CAN
PANIC ALL
WE WANT
LATER.

HUH
?!



ハッ
KRAK

ハッ
KRAK

THIS
BODY
IS
ALLLL...

HYAH
HA
HA!



GRAAA
AAAAA
AAAH!

SLASH

...OURS
N—
GUUH!

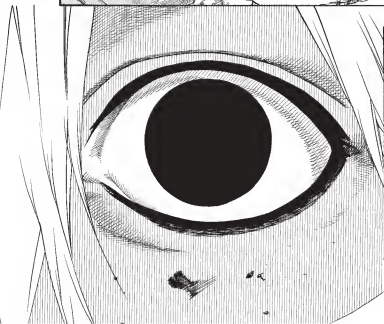
THINK
YOU'RE
GETTING
AWAY?!

WHITE
BLOOD CELL
1143

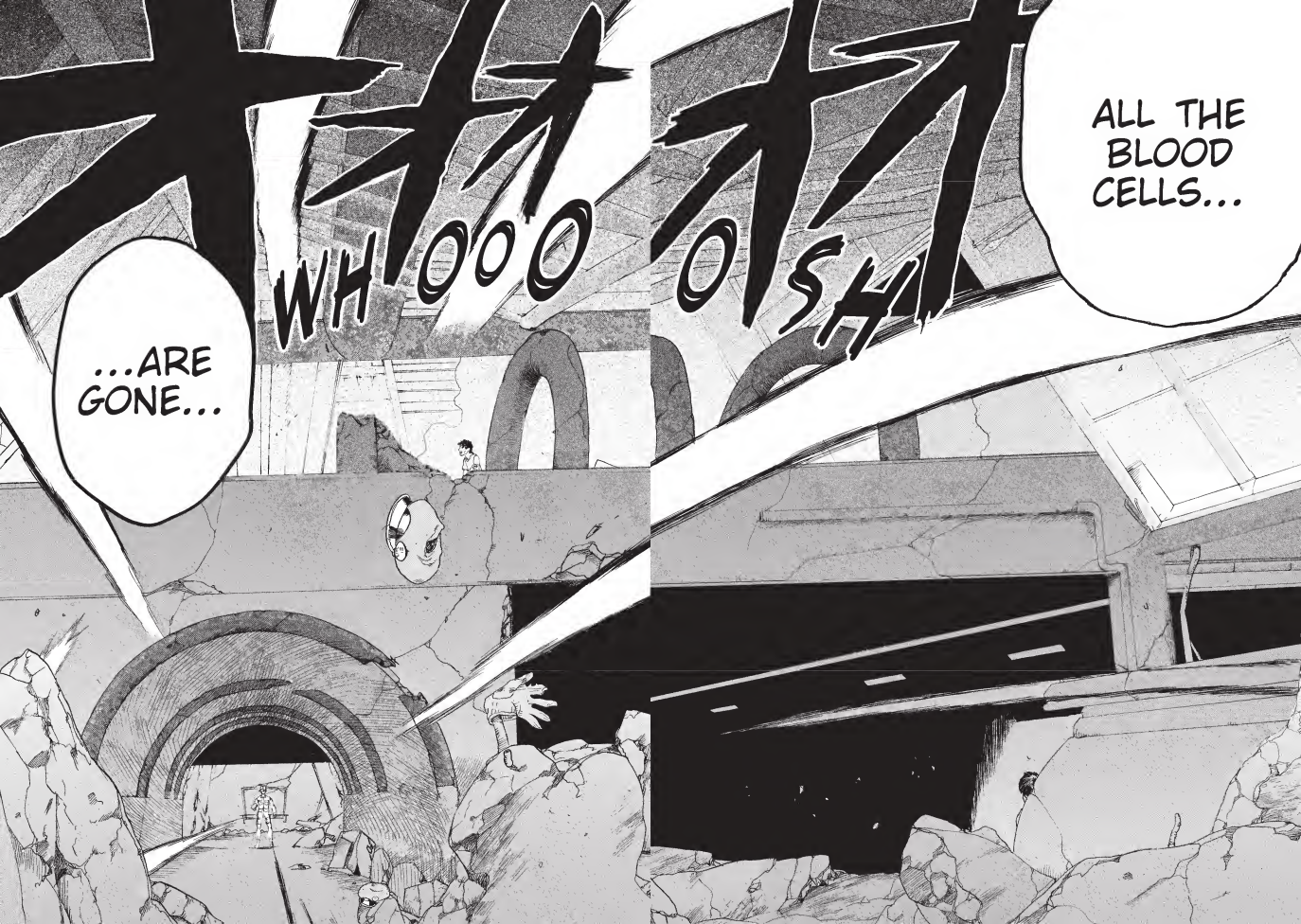
I'LL
JUST GET
AWAY
THROUGH
A BLOOD
VESSEL—

ハッ
SMASH

UGH!
WHITE
BLOOD
CELLS
ARE ALL
OVER THE
TISSUES!







...ARE
GONE...

ALL THE
BLOOD
CELLS...

WH OOO

OSH

EMERGENCY! THE
LOSS OF BLOOD
CELLS DUE TO
HEMMORHAGE
IS GROWING
INCREASINGLY
SEVERE!

WHITE
BLOOD CELL

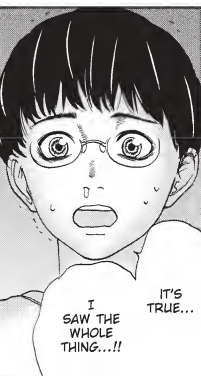
BA-
DMP

BA-
DMP

CHAPTER 17: END



Cells at
Work!
はたらく細胞



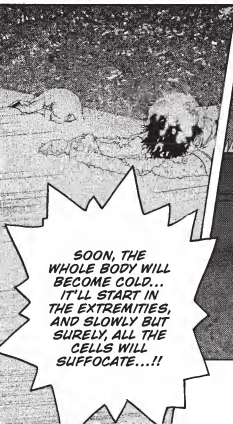
White Blood Cell (Neutrophil)

His main job is to destroy foreign substances that enter the body from the outside, such as bacteria and viruses.

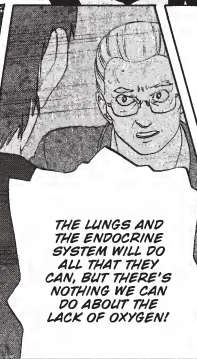


THOUSANDS,
MILLIONS—
NO, EVEN
MORE.
SO MANY
BLOOD
CELLS...

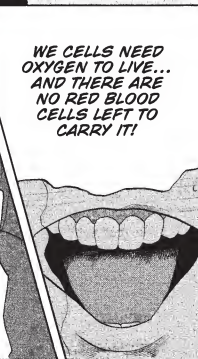
...FLYING
TOWARD THE
WOUND
ALL AT ONCE
LIKE THEY
WERE BEING
SUCKED
OUT...!!



SOON, THE
WHOLE BODY WILL
BECOME COLD...
IT'LL START IN
THE EXTREMITIES,
AND SLOWLY BUT
SURELY, ALL THE
CELLS WILL
SUFFOCATE...!!



THE LUNGS AND
THE ENDOCRINE
SYSTEM WILL DO
ALL THAT THEY
CAN, BUT THERE'S
NOTHING WE CAN
DO ABOUT THE
LACK OF OXYGEN!



WE CELLS NEED
OXYGEN TO LIVE...
AND THERE ARE
NO RED BLOOD
CELLS LEFT TO
CARRY IT!

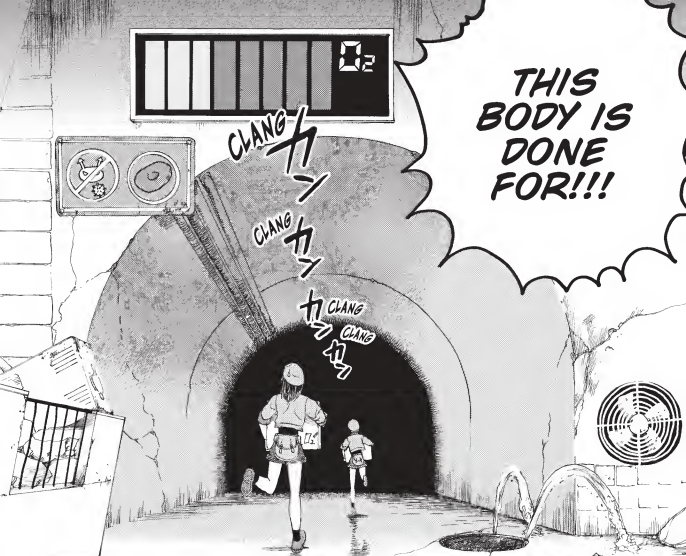


....!!



DO YOU
KNOW
WHAT THAT
MEANS?!

AND EVEN
NOW, THE
BLEEDING
HASN'T
STOPPED
...!!



Red Blood Cell
Her red color is due to the chemical hemoglobin. She transports oxygen and carbon dioxide through blood circulation.

MR.
CELL?!

OXY-
GEN...

GIVE ME
OXY-
GEN...

WHEEZE
WHEEZE

C-CAN'T
BREATHE.

THERE'S
SOMETHING
WRONG
WITH
THEM.

SENPAI,
LOOK!

WHAT'S
WRONG?!

WHEEEN

CAN'T
BREATHE...
I'M
DYING...

WHERE'S
OUR
OXYGEN...?

PLEASE
HANG ON!
WE'LL
BRING IT
RIGHT
AWAY!

WHAT...
IS
THIS...?



WHOA!

IS IT
JUST ME,
OR ARE
THERE
FEWER OF
US...?

LOOK
HOW HARD
THEY'RE
WORKING!!

THE
LUNGS
...!!

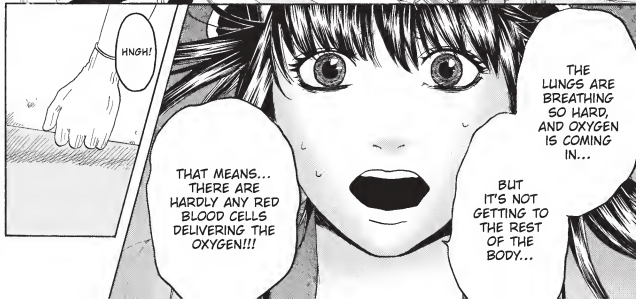
SOMEONE!
HELP US
CARRY THIS
OXYGEN!

AUGH

WAGA

WAGH

WAGH



HNGH!

THAT MEANS...
THERE ARE
HARDLY ANY RED
BLOOD CELLS
DELIVERING THE
OXYGEN!!!

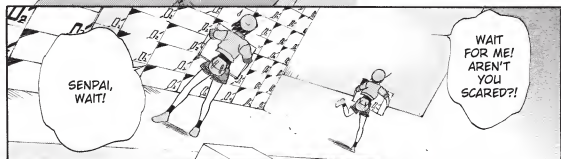
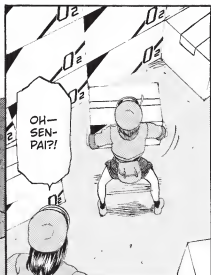
THE
LUNGS ARE
BREATHING
SO HARD,
AND OXYGEN
IS COMING
IN...

BUT
IT'S NOT
GETTING TO
THE REST
OF THE
BODY...

AE
3803

THIS IS
NO TIME
TO STAND
AROUND
PANICKING!
WE HAVE
TO CARRY
THIS.

THERE
ARE CELLS
COUNTING
ON US!



THERE'S
NO WAY
THE CELLS
WILL GET
ENOUGH
OXYGEN
LIKE THIS!

I'VE
NEVER
SEEN
SO
FEW RED
BLOOD
CELLS GOING
THROUGH
THE BLOOD
VESSELS....!!

LOOM!

USE BLOOD
PRESSURE
TO FORCE
THE RED
BLOOD CELLS
THROUGH!

WE'VE
GOT NO
CHOICE
BUT TO
STEP IN.

YES,
SIR!

CIRCULATE AT
FULL POWER!

DAMN IT!
WHAT THE
HELL IS
GOING ON?!

SHOVE

WHOA—
HEY, STOP
PUSHING.

GUH...

IT'S NOT ME!
THE BLOOD
PRESSURE
WENT UP, SO
I'M BEING
PUSHED FROM
BEHIND...

OH—
LOOK
OUT!

H-HANG
IN THERE,
KOHAI-
CHAN!

HAAH!

HAAH!



WHOA!

WHOA!
WHOA!

RRROARR RRR

CRUMBLE

CRUMBLE

CRUMBLE



G A A A H !

WHO
THE HELL
PUMPED UP
THE BLOOD
PRESSURE
WHEN
THERE'S A
WOUND?!

Symptoms of Heavy Bleeding
Increased Blood Pressure
In the early stages of heavy bleeding,
the sympathetic nervous system is
stimulated, and blood pressure rises.



WE'RE
ALMOST
THERE,
SO LET'S
JUST KEEP
GOING!
OKAY?!

...!

NGH...



NGH...

D-
DON'T
LOOK
BACK,
KOHAI-
CHAN!



GROUP
LEADER, I
HAVE BAD
NEWS!
INCREASING
THE BLOOD
PRESSURE
ONLY MADE
THE
BLEEDING
WORSE...

WHAAT?!



EEEEK!
A
BLIZZARD?!

**Symptoms of Heavy Bleeding
Reduced Body Temperature**
The body temperature falls
due to the reduced amount
of blood in circulation.



EVEN IF IT'S
JUST US, WE HAVE
TO CARRY OXYGEN,
OR CELLS WILL DIE!

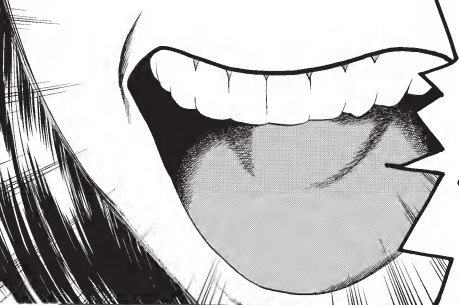


BE
STRONG,
KOHAI-
CHAN!



AH!
KOHAI-
CHAN!





**STOP IT
ALREADY!!**

**DO YOU
REALLY
THINK
THERE'S
ANYTHING
WE CAN DO
TO CHANGE
THIS
SITUATION?!**



**JUST
TAKE A
LOOK
AROUND!**

**THERE
AREN'T
ANY RED
BLOOD
CELLS LEFT
BESIDES
US!**



**THERE'S
NO WAY
WE CAN
SUPPLY
ENOUGH
OXYGEN!**

**ISN'T
THAT
RIGHT?!
IT'S NO
USE!!**



**YOU'RE
ONLY
TRYING TO
IMPRESS
YOUR
KOHAI!**

**DON'T YOU
GET IT?! THIS
IS DEATH FROM
HYPOVOLEMIC
SHOCK!!!**

Hypovolemic Shock

Massive bleeding due to injury to the blood vessels or digestive tract can cause loss of blood pressure, which leads to dizziness or fainting. Without adequate treatment, this can result in death. Loss of one third of the blood is said to lead to hypovolemic shock.

**THIS
BODY
IS
DONE
FOR!!**



**THE BODY
DIES IF
IT LOSES
A THIRD
OF ITS
BLOOD!!**



SMOOSH

WE
SHOULD
JUST—
MPFF!



KOHAI-
CHAN—!



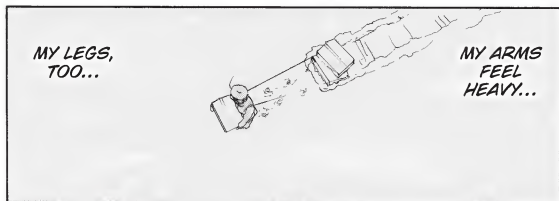
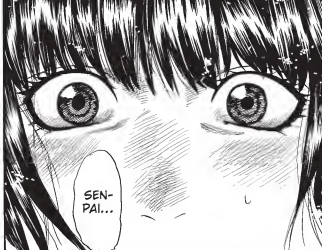
HUH...?

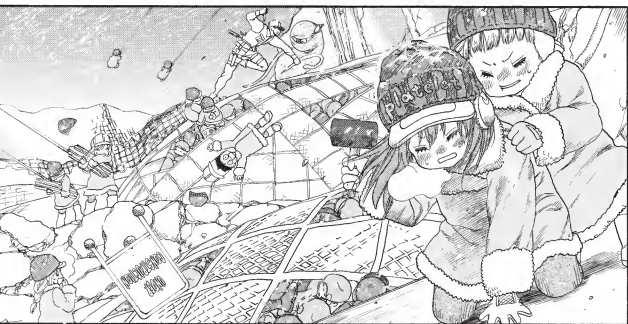
WHA...
STOP,
WHAT'RE
YOU—?!

AE
3803

**BECAUSE
THAT'S
MY JOB.**

**I'M GOING
TO CARRY
OXYGEN
UNTIL THE
END!**



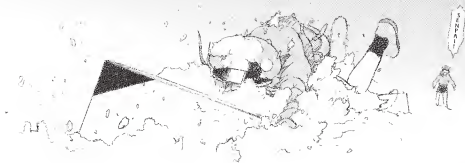


I HAVE TO
DELIVER...



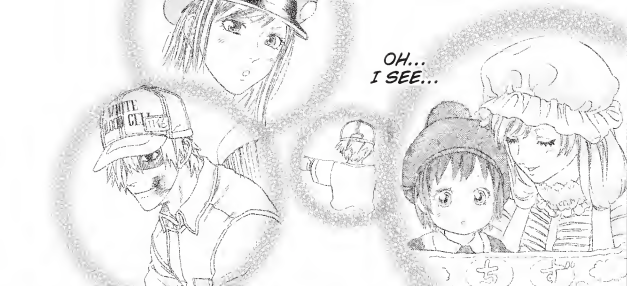
...THIS...

...OXYGEN...



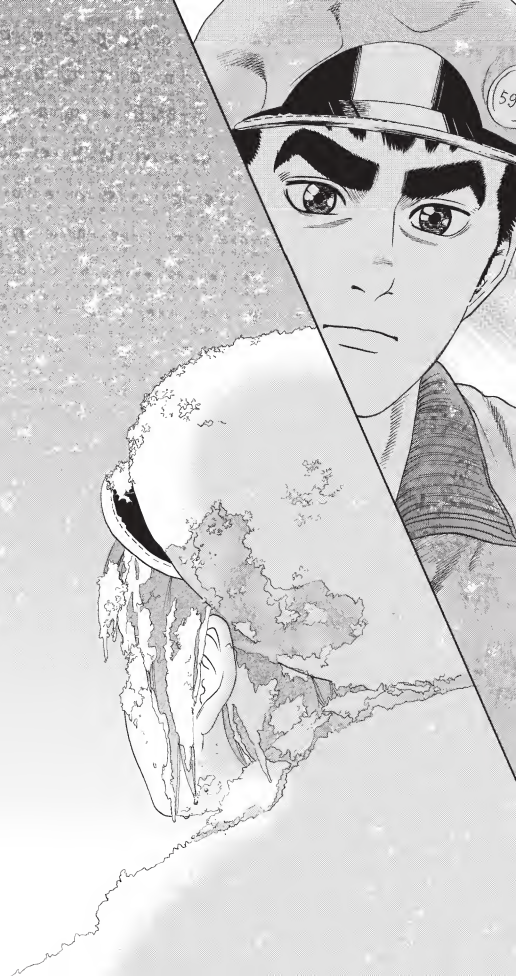
Symptoms of Heavy Bleeding
Drop in Blood Pressure
As the amount of blood in circulation drops, the blood pressure falls.

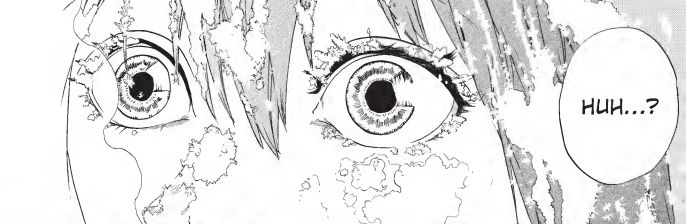




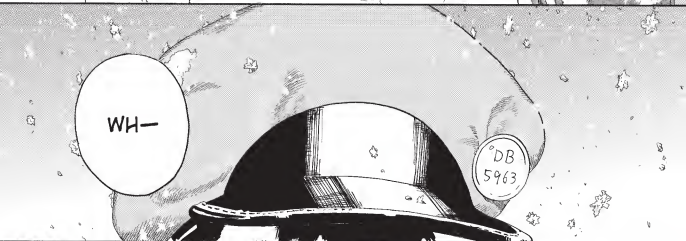


YA OKAY,
THERE?



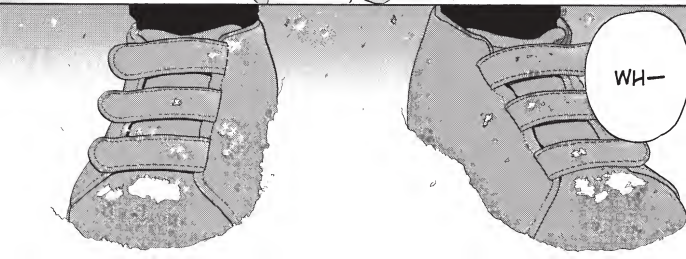
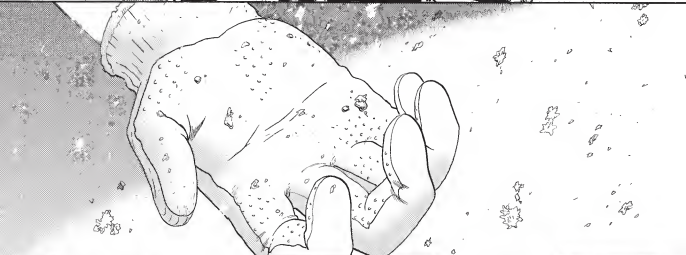


HUH...?



WH—

DB
5963



WH—



THIS
PLACE
SURE IS
COLD,
INNIT?

WHAT
CELL ARE
YA?

WHO ARE
ALL THESE
CELLS?!!

TRY TO FIND HER!

SWARM

SAY, THAT
LIL' LADY'S
DRESSED
LIKE A RED
BLOOD
CELL.

WHAT
KINDA
WORK DO
YA DO?

BUT
HERE
WE ALL
ARE...

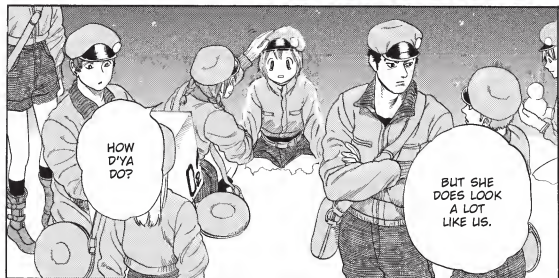
DUNNO.

GEE,
WHERE
ARE
WE?



HUH, HER
UNIFORM'S
A LITTLE
DIFFERENT
FROM
OURS,
THOUGH.

MAYBE
SHE'S A RED
BLOOD CELL
LIKE US, DO
YA THINK?



HOW
D'YA
DO?

BUT SHE
DOES LOOK
A LOT
LIKE US.



...AND WE
DON'T HAVE
ENOUGH
PEOPLE TO
DELIVER
OXYGEN...

UH-UM,
SO IT'S A
LONG
STORY...

WHY'RE
YA SO
TIRED?

SNOW ALL
OVER YA.

WHAT?!

ARE
YA SAYIN'...
THAT THE BODY
WE'RE IN IS AT
ITS END?!

HEY,
EVERY-
ONE,
WE
GOT A
SITUA-
TION!

AFTER
WE WERE
DRAGGED
ALL THE WAY
OVER HERE?!
THIS AIN'T
FAIR!

SHOCK
カビーン

ALL
RIGHT!

AND WE GOT TO
BAND TOGETHER
WHEN TIMES ARE
TOUGH! WELL,
WE'RE HERE NOW!
WE'RE RED BLOOD
CELLS—MIGHT
AS WELL GO WITH
THE FLOW.

THEY SAY NO
JOURNEY IS
TOO HARD
WITH GOOD
COMPANY...

LONG STORY
SHORT,
THAT'S HOW
IT IS.

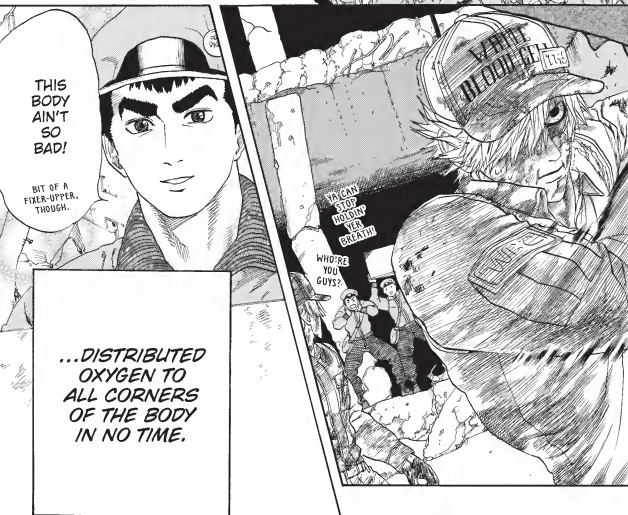
LET'S
ALL
WORK
TOGETHER
...

WE MIGHT
BE FROM
DIFFERENT
BODIES,
BUT OUR
JOBS ARE
THE SAME.

YEA A A H !!



...AND
CARRY
THIS
HERE
OXYGEN
!!!



THIS
BODY
AIN'T
SO
BAD!

BIT OF A
FIXER-UPPER,
THOUGH.

...DISTRIBUTED
OXYGEN TO
ALL CORNERS
OF THE BODY
IN NO TIME.

WE CAN
STAY
ALIVE
FOR
BREATHE

WHO'RE
YOU
GUYS?



WHO'RE
YOU NOW!



I'M A RED
BLOOD
CELL
HEART!

YOU'RE
A
HEART!



THE RED
BLOOD CELLS
WHO
APPEARED
OUT OF
NOWHERE...

O2



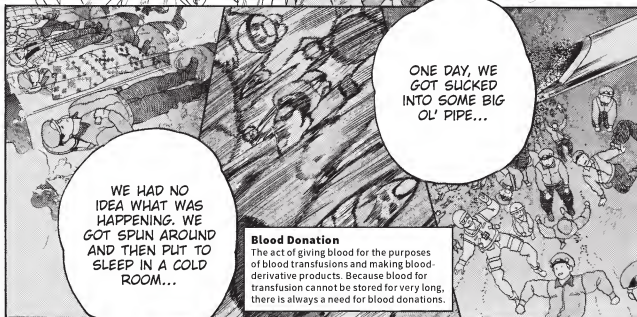




NO
IDEA.

BUT WE'RE
SAVED,
THANKS TO
THEM.

WHERE
DID THE NEW
RED BLOOD
CELLS
COME FROM,
DO YOU
THINK...?



ONE DAY, WE
GOT SUCKED
INTO SOME BIG
OL' PIPE...

WE HAD NO
IDEA WHAT WAS
HAPPENING. WE
GOT SPUN AROUND
AND THEN PUT TO
SLEEP IN A COLD
ROOM...

Blood Donation

The act of giving blood for the purposes of blood transfusions and making blood-derivative products. Because blood for transfusion cannot be stored for very long, there is always a need for blood donations.

...HERE
WE ARE!



AND THE
NEXT
THING WE
KNOW...

Blood Transfusion

A treatment to supply the body with the blood components it needs. Donated blood is spun in a centrifuge to separate it into its components: Red blood cells, platelets, plasma, and coagulation factors. These can then be transfused as required.



...BUT
I'M GLAD
TO BE
WORKIN'
IN ONE
AGAIN.

THIS
PLACE IS
DIFFERENT
FROM
OUR OLD
BODY...

WOW,
WHAT A
STRANGE
STORY.



WHERE
DID THEY
COME
FROM...?

SERIOUSLY.

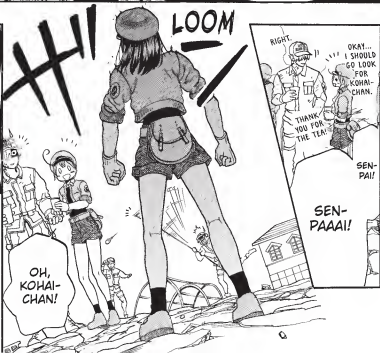
THEY SURE
ARE GETTING
ALONG WELL.



SH-
SHE'S
MAKING
A
SCARY
FACE!!

...SOME-
THING
I NEED
TO TELL
YOU,
SENPAAI...

I...I
HAVE...



OH,
KOHAI-
CHAN!

RIGHT.
THANK
YOU FOR
THE TEA!

OKAY... I SHOULD
GO LOOK
FOR
KOHAI-
CHAN.

SEN-
PAI!

SEN-
PAAAI!



THANK
YOU SO
MUCH!!

ABOUT
MY TRAIN-
ING...



THAT THIS
JOB TAKES
MORE THAN
KNOWLEDGE,
THAT WE NEED
EXPERIENCE,
AND ALSO—

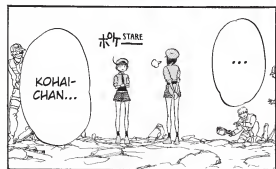
A
BURNING
PASSION
!!



OH, AND
I REALLY
AM, TO
BE SURE.

I'VE ALWAYS
THOUGHT OF
MYSELF AS
ONE OF THE
TALENTED
ONES...

UH...
SURE.



KOHAI-
CHAN...

!! STARE

...

THAT
OUR JOB
IS MORE
THAN THAT.

BUT YOU
TAUGHT ME
SOMETHING
REALLY
IMPORTANT,
SENPAI—





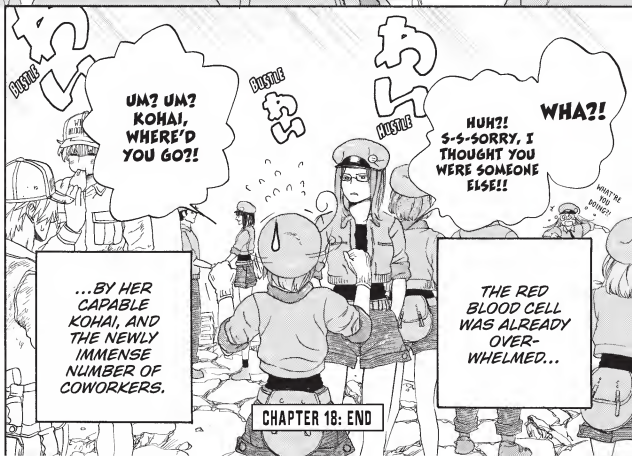
—FOR-
WARD...?

HUH...?

UH,
SURE.
I HOPE
WE DO,
TOO...
WHO ARE
YOU?

I'M LOOKING
FORWARD TO
WORKING
WITH YOU.

THANKS,
SAME
HERE.



UM? UM?
KOHAI,
WHERE'D
YOU GO?!

HUH?!
S-S-SORRY, I
THOUGHT YOU
WERE SOMEONE
ELSE!!

WHA?!

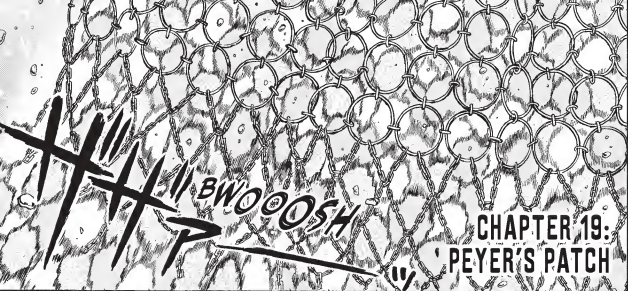
...BY HER
CAPABLE
KOHAI, AND
THE NEWLY
IMMENSE
NUMBER OF
COWORKERS.

THE RED
BLOOD CELL
WAS ALREADY
OVER-
WHELMED...

CHAPTER 18: END



Cells at
Work!
はたらく細胞



CHAPTER 19:
'PEYER'S PATCH'



ANOTHER
BATCH
COMING!

WE'VE
GOT
LACTOSE,
SUCROSE
...

...AND
MALTOSE
!!



White Blood Cell (Neutrophil)

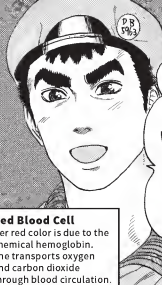
His main job is to destroy foreign substances that enter the body from the outside, such as bacteria and viruses.

WOW!!

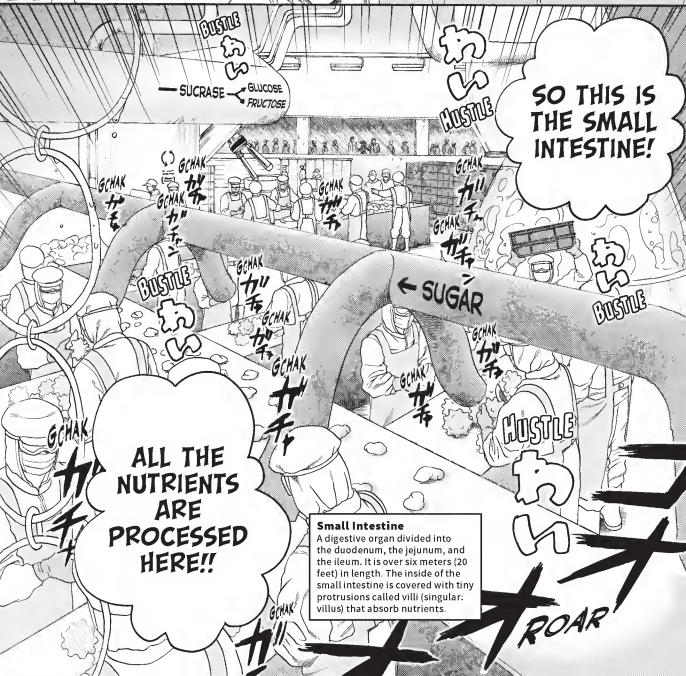


Red Blood Cell

Her red color is due to the chemical hemoglobin. She transports oxygen and carbon dioxide through blood circulation.



WHOA!



SO THIS IS THE SMALL INTESTINE!

ALL THE NUTRIENTS ARE PROCESSED HERE!!

Small Intestine

A digestive organ divided into the duodenum, the jejunum, and the ileum. It is over six meters (20 feet) in length. The inside of the small intestine is covered with tiny protrusions called villi (singular: villus) that absorb nutrients.

ROAR



ME,
TOO!
THERE'S
A LOTTA
SMALL
INTER-
ESTING
DIFFER-
ENCES!!

I HOPE
YOU GET
USED TO
THIS NEW
BODY
SOON,
RED BLOOD
CELL.



THIS PLACE
HAS GOT A
LOTTA ENERGY TO
IT. I LIKE IT!

DON'T
MEN-
TION
IT.

YOU'RE
WELCOME.

I DON'T
KNOW THIS
AREA WELL
AT ALL...

THANK
YOU FOR
SHOWING
US, WHITE
BLOOD
CELL!



HEY,
NEUTRO-
PHIL...



THANK
YOU!

LET'S
SIP
AS WE
WALK.

THIS PLACE
IS BIG.

OH, WHY
DON'T I
GO GET
SOME
TEA?

IN THESE
INTESTINES,
THERE'RE
HUNDREDS OF
TRILLIONS OF
GERMS SWARMING
JUST ACROSS
A SINGLE
MEMBRANE...
AREN'T YOU
LOOKING AWFULLY
RELAXED
FOR SOMEONE
IN CHARGE OF
ELIMINATING
BACTERIA?



YOU'VE
GOT
SOME
NERVE,
MAN.



MAYBE WE SHOULD GIVE UP WHEN THE GERMS INVADE!!

NEVER THOUGHT I'D SEE SUCH A PEACE-ADDLED NEUTROPHIL.

IT'S A BATTLEFIELD WHERE WE IMMUNE CELLS AND BACTERIA STARE EACH OTHER DOWN EVERY DAY!

THIS ISN'T A TOURIST DESTINATION FOR YOU LACKADAISICAL DUMMIES TO WANDER AROUND IN!

AT THIS RATE, YOU AND ALL YOUR NEUTROPHIL BUDDIES WILL GET SLAUGHTERED, AND IT'LL BE THE END FOR US!

KILLER T...

KILLER

HMMPH!

YOU'RE THE ONE WHO MESSED UP.

WHAT? YOU GOT SOMETHING TO SAY TO ME?

THAT'S NOT WHAT'S GOING ON HERE.

H-HEY NOW, CALM DOWN, BOTH OF YOU.

YOU DON'T GET IT.

DON'T GO OUT OF YOUR WAY FOR THAT CRAP! YOU JUST THINK ABOUT KILLING ENEMIES.

I WAS SHOWING THEM AROUND TO HELP THE NEW RED BLOOD CELL GET USED TO THE PLACE.

...IT MAKES ME
WONDER IF
YOU'LL BE READY
WHEN SOMETHING
DOES HAPPEN!
WHAT IF WE'RE...

I'M
SAYING—
YOU'RE
ACTING
SO CARE-
LESSLY...

RUMBLE

...INVADED BY
BACTERIA...

RIGHT...
NOW...

BOOM

WHOA!!

WE'RE BEING
ATTACKED BY
BACTERIA THAT
MULTIPLIED
IN THE
NUTRIENTS!

THAT
COLONY
ISN'T MADE
OF ANY
INTESTINAL
BACTERIA!

STEP
IN AND
HELP
US IF
WE
NEED
YOU!

KILLER T,
WE'LL
CONTINUE
OUR CHAT
LATER.

RIGHT...

THEY'VE
DESTROYED
THE SUR-
ROUNDING
TISSUE!
SEND BACKUP
NOW!

THIS IS
NUMBER 1146!
A COLONY OF
BACTERIA
LANDED IN
COORDINATES
D6-18 IN THE
SMALL
INTESTINE!



...IF THE
LIFE OF THIS
INTESTINAL
EPITHELIAL
CELL MEANS
ANYTHING TO
YOU!!!

OF
COURSE,
YOU'LL
HAVE TO
DO AS WE
CAMPYLO-
BACTERS
SAY...

BAM

Campylobacter

A pathogen responsible
for infectious enteritis,
causing fever, diarrhea,
and stomachaches.

Intestinal Epithelial Cell

Responsible for absorbing nutrients
and water. They also form a barrier
that prevents excessive reactions to
bacteria in the small intestines.



WE'RE
NOT
ALLOWED
TO MAKE
A MOVE
UNTIL WE
RECEIVE
ORDERS
TO
DEPLOY!

TH-
THEY
TOOK A
HOS-
TAGE...

UM,
SHOULDN'T
WE GO,
TOO?

WHAT
A
DIRTY
TRICK
!!



WHA...
A
HOS-
TAGE
?!

SHOCK
アッ

NOW, IF
WE STAY
HERE,
YOUR
FRIENDS
MIGHT TRY
A SNEAK
ATTACK.

WE'VE
BEEN
STRAT-
EGIZING,
TOO...

YOU'VE
KILLED SO
MANY OF US,
AFTER ALL. YOU
WHITE BLOOD
CELLS HAVE TO
PROTECT THE
LIVES OF NORMAL
CELLS.

H-
HELP
ME!!

FOLLOW
US IF YOU
CAN, WHITE
BLOOD
CELLS!

BWA HA HA HA HA HA

SO WE'LL
RETREAT
INTO THE
INTESTINES
FOR NOW.

WHAT DO
WE DO?!
WE CAN'T
LEAVE
THESE
TISSUES!

ボ
GLUB
ボ

WHAT ARE
YOUR
DEMANDS?!

HEH
HEH.

ボ
GLUB
ボ

CAMPYLO-
BACTER,
WAIT!
RELEASE
THE
HOSTAGE!!

ボ
GLUB
ボ



...COMFORT-
ABLE
FOR US
NAUGHTY
GERMS.

WE
WANT
YOU TO
MAKE
THESE
INTES-
TINES...

WE'LL GET
THREE MEALS A
DAY, PLUS NAPS.
YOU'LL LET US BUILD
A COLONY ON A
PEACEFUL PIECE
OF PRIME REAL
ESTATE WITH
A VIEW!



I'LL
DO MY
TRICK
NOW!

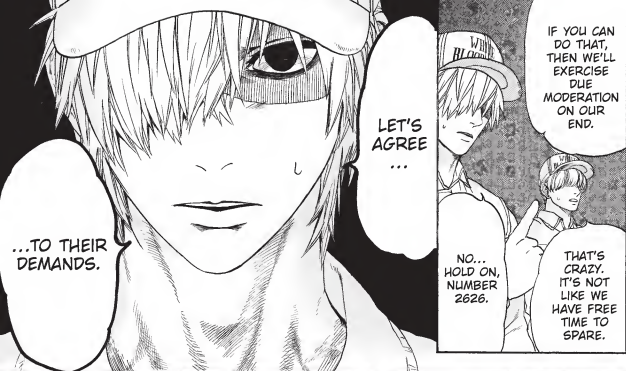
YOU'LL
DELIVER THE
NUTRIENTS TO
US FIRST, AND
GET RID OF
ANY BACTERIA
THAT GET IN
OUR WAY!

A PARADISE
OF
CAMPYLOBACTERS,
BY
CAMPYLOBACTERS,
FOR
CAMPYLOBACTERS!!

AND YOU WHITE
BLOOD CELLS
WILL ENTERTAIN
US EVERY DAY,
PERFORMING
TRICKS FOR
US FROM YOUR
SIDE OF THAT
GLASS!



HEE HEE HEE HEE





FINE!
WE'LL
RELEASE
THE HOS-
TAGES.

BUT
BEFORE
I DO,
YOU'LL
DO
AS I
SAY
!!

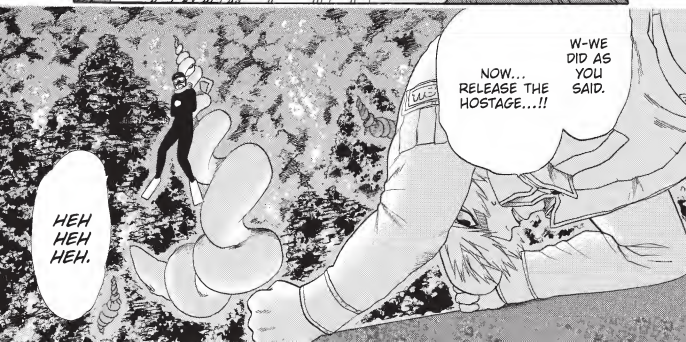
I ALWAYS
THOUGHT HE
WAS STUPID,
BUT I DIDN'T
KNOW HE
WAS THIS
STUPID...!



WH-WHAT
IS THAT
IDIOT
DOING...?!



UURGH...



NOW...
RELEASE THE
HOSTAGE...!!

W-WE
DID AS
YOU
SAID.

HEH
HEH
HEH.



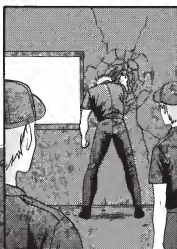


HOW COULD
YOU NOT TELL
THAT HE HAD NO
INTENTION OF
RELEASING THE
HOSTAGE?!!!

Y-YOU
IDIOTS!



AH HA
HA HA
HA!





AH
HA
HA
HA!

LOOK
AT YOU
NOW!!



THAT'S
WHAT YOU
GET FOR
UNDER-
ESTIMATING
BACTERIA!!

WE CAN'T
LET 'EM GO
THAT WAY.

W-WAIT!

BLOPP

SEE
YOU!

LIVE

GLARE

LIVE

MAN...

I CAN'T
JUST SIT
HERE AND
WATCH...

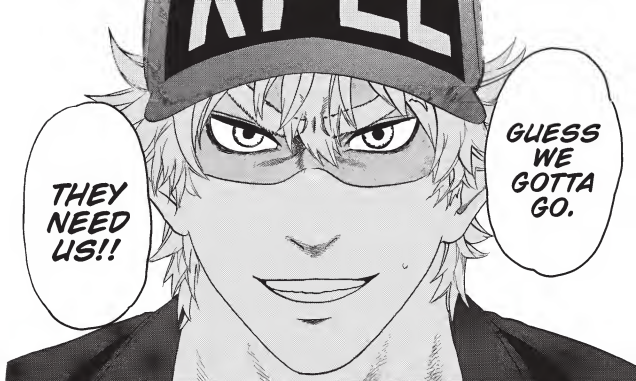
HUH?

GRIP

OH
NO!

THE
BACTERIA
GOT
AWAY...

...WITH THE
HOSTAGE!!



THEY
NEED
US!!

GUESS
WE
GOTTA
GO.

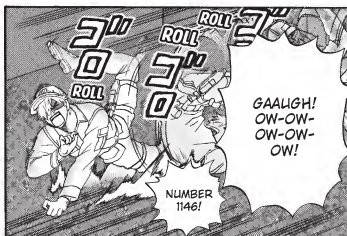


YOU PESKY
FOOLS!
YOU STILL
HAVE THE
STRENGTH
TO RUN?!



OH NO,
THEY'RE HEADED
FOR—

HM?



GAAUGH!
OW-OW-
OW-OW-
OW!

NUMBER
1146!



YOU—
DO YOU
KNOW WHAT
THEY'RE
TALKING
ABOUT?

SOR-
RY.

OH,
THIS
PLACE!

SHH!
HE'LL
FIND
OUT!

THEY'RE
SHOUTING
ABOUT
SOMETHING.

W-
WELL...

YOU
IDIOT!
DON'T
SHOUT
THAT!

HEY, THIS IS
BAD! WE'RE
CLOSE TO A
SPOT WHERE
THEY'D HARDLY
HAVE TO TRY
TO INVADE!

THAT
SPOT HAS
NO VILLI, SO
IT'S EASY
FOR BACTERIA
TO GET IN!



HM? OH,
SURE, I
WILL.☆

UMMM...

IF I TELL
YOU...WILL
YOU SPARE
MY LIFE?



TELL HIM
ANYTHING
BUT THAT!!

YOU SEE...UP
HERE THERE'S
A PLACE WHERE
THE VILLI ARE
SPARSE AND
THE MEMBRANE
IS THIN...

NOOOO!
D-DON'T DO
IT, INTESTINAL
EPITHELIAL
CELL!



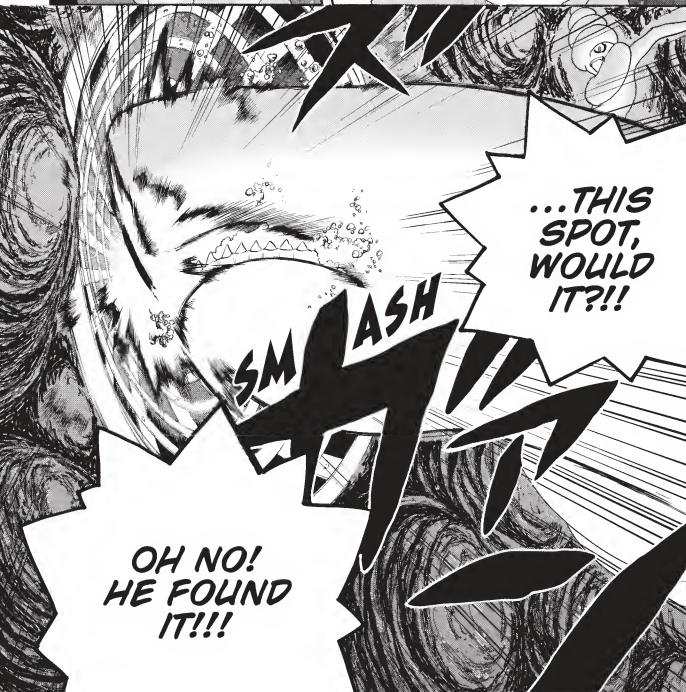
HMM...

THAT
WOULDN'T
BE...

HUH!
SOUNDS
LIKE A
GREAT
PLACE.

IT'S A VERY
VULNERABLE
SPOT, IF I DO
SAY SO MYSELF.

VERY EASY
FOR YOU
AND YOUR
FRIENDS TO
INFILTRATE.



...THIS
SPOT,
WOULD
IT?!!

SMASH

OH NO!
HE FOUND
IT!!!



SHUT UP!
I HAVE NO
MORE USE
FOR YOU!!

和
T
TOSS

UH,
SO WHAT
ABOUT
ME...?



CHA-

CHING

YEEHAW!!

OVER
HERE,
EVERY-
ONE!!

I'VE
INFILTRATED
THE TISSUE.

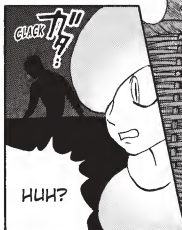
WE WON'T
GO HUNGRY
FOR GENER-
ATIONS!!

WE'LL
HAVE ALL
THE FOOD AND
NICE WARM
SHELTER WE
WANT....!!

TIME TO
SCARF 'EM
DOWN AND
MULTIPLY
LIKE
CRAZY!♡

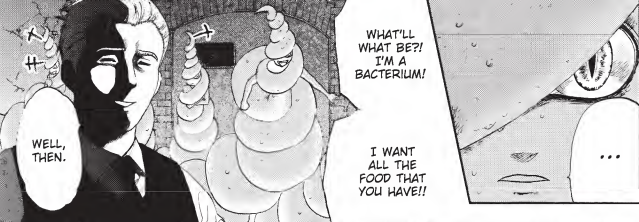
YESSSS!♡
NUTRIENTS!
OUR LUCKY
DAY!♡

LOOK AT
IT ALL!



WELCOME.

WHAT'LL
IT BE,
GENTS?



WELL,
THEN.

WHAT'LL
WHAT BE?!
I'M A
BACTERIUM!

I WANT
ALL THE
FOOD THAT
YOU HAVE!!

...



IT IS...
YOUR LAST
SUPPER,
AFTER ALL...
EAT TO YOUR
HEARTS'
CONTENT...

HEH
HEH...

PLEASE,
ENJOY
YOUR
MEAL.



GRAB

WHAT-
EVER.
I'LL JUST
HELP
MYSELF...

WHAT'RE
YOU
TALKING
ABOUT?



KILL

I'VE
BEEN
WAITING
A LONG
TIME FOR
THIS...

...CAMPYLO-
BACTER.

HUH...?
AN
IMMUNE
CELL?!

WHAT'RE
YOU DOING
HERE?!



IT'S
PAYBACK
TIME...

TURN

YOU
BACTERIA
SURE ARE
STUPID.

CAN'T
BELIEVE
YOU DIDN'T
REALIZE WE
WERE
LEADING
YOU ON.

NOW
YOU'LL SEE
WHAT WE
NEUTROPHILS
CAN DO.

YOU TOOK
A HOSTAGE
LIKE A
COWARD.

THIS
PLACE...

YOU
BACTERIA
NEVER DO
YOUR
HOMEWORK.



THIS
IS A
PEYER'S
PATCH.

Peyer's Patch

An immune tissue in the small intestine, common in between villi or where villi are scarce. It is filled with lymphoid nodules, and plays an important role in the immune response of the intestines.

...IS AN
IMMUNE TISSUE
FOR LURING IN
DUMB BACTERIA
LIKE YOU SO
WE CAN KILL
YOU ALL AT
ONCE.

...TELLING
THEM THAT
WE'D LURE
YOU TO
A PEYER'S
PATCH.

YOU NEVER
PICKED
UP ON IT...

...BUT WHEN YOU
KNOCKED US DOWN,
WE SENT A SIGNAL TO
THE KILLER T CELLS
AND TO INTESTINAL
ENDOTHELIAL CELL...

A...
SIGN?

...AN "M"
FOR M
CELL!!

YES, WE
MADE...

LOOK
AT YOU
NOW!!

M Cell

Cells that live on the surface
of Peyer's patches and capture
bacterial and viral antigens. The
captured bacteria and viruses
are handed over to dendritic
cells and presented as antigens.

I'M M
CELL.

I RUN
THIS
PEYER'S
PATCH.



WHAT
A
DIRTY
TRICK
!!!

WH-
WH-

SOB

わっ



**SHUT
UP!!
YOU'RE
ONE TO
TALK!!!**

THWACK!
FWEEK!

**カ
ア**

WA HA HA HA HA

AH,
ALL'S
WELL
THAT
ENDS
WELL.

GREAT
JOB
TRAPPING
THEM.

CERTIFICATE OF
APPRECIATION
FOR MAKING A SIGNIFICANT
CONTRIBUTION TO ELIMINATING
THE ENEMY.
WE HEREBY COMMEND YOUR
DEEDS AND EXPRESS OUR
DEEPEST GRATITUDE.

BUT
FROM
NOW
ON—

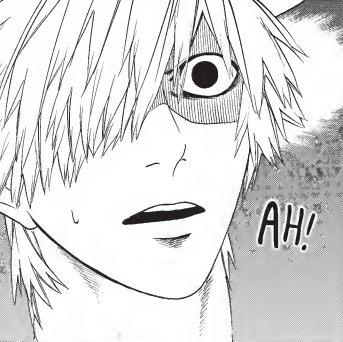
I TAKE
BACK
WHAT I
SAID.

TRY NOT TO
TAKE IT TOO
EASY...

KILLER
T...

I KEPT
CALLING
YOU
STUPID...

...BUT YOU
KNOW HOW
TO USE
THAT HEAD
OF YOURS
AFTER ALL.



"TAKE
IT TOO
EASY..."

"TRY NOT
TO TAKE
IT TOO
EASY..."

I FEEL
LIKE I'M
FOR-
GETTING
SOME-
THING...



HM?

HUH?



MAYBE
HE GOT
LOST...?

WHITE
BLOOD
CELL IS
TAKING
A LONG
TIME...

...HOW
FAR DID HE
GO FOR
TEA, YA
THINK?



OKAY,
SO HE /S
STUPID...

I FORGOT
TO GET TEA
FOR THE
RED BLOOD
CELLS!!

SHOOT!

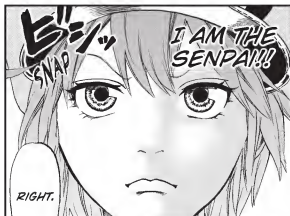
CHAPTER 19: END



CELLS AT WORK! VOLUME 4: ENO

Medical Editor: Tomoyuki Harada

TRANSLATION NOTES



Senpai and Kohai

Page 68

The Japanese word “*senpai*” roughly translates to “upperclassman” or “senior.” While it is used by students to refer to their older peers, it is not necessarily an academic term, and can be used to refer to anyone in a given situation who’s more experienced than the speaker but not necessarily in a position of authority over them, as opposed to a teacher or a boss, who would not be considered a *senpai*.

“*Kohai*,” meanwhile, refers the the opposite—someone who is junior or less experienced. An underclassman at a school would be an upperclassman’s *kohai*, and a newly hired employee would likewise be their more experienced colleagues’ *kohai*.

Senpai are generally obliged to look out for their *kohai*, while *kohai* are expected to respect their *senpai*.

Ora ora ora!

Page 71

White Blood Cell’s exclamation as he tears into the bacterium is an expression of macho self-aggrandizement that may derive from the words “ore da,” which are a particularly brash and masculine way of saying “it’s me!”

However, the phrase has become best known for being a recurring catchphrase in *JoJo’s Bizarre Adventure*, Hirohiko Araki’s long-running manga series, where (as it is here) it’s shouted during an attack, typically with many more than the three repetitions White Blood Cell uses here.





Kohai-chan

Page 85

In Japanese the suffix “-chan” is a diminutive honorific that denotes affection as well as implying a certain degree of social seniority on the part of the speaker. Like most honorifics in Japan, it would typically be used in conjunction with a proper name.

Red Blood Cell's usage of -chan with the term *kohai* is as charmingly eccentric (and slightly airheaded) as you might expect it to be.

Kansai dialect

Page 109

The transfused red blood cells that save the day are immediately identifiable as unusual because of their speech. Starting with the very first line, they use the dialect of the Kansai region of Western Japan—an area which includes Osaka, Kyoto, and Kobe. *Kansai-ben*, as it's known in Japanese, is strongly associated with the heartily mercantile culture of Osaka, and is typically thought to sound earthier and jauntier than standard Tokyo-area Japanese.



Cells at
Work!

はたらく細胞

KC
KODANSHA
COMICS

A new
series
from the
creator
of *Soul
Eater*, the
megahit
manga and
anime seen
on Toonami!

"Fun and lively...
a great start!"
-Adventures in
Poor Taste

FIRE FORCE

By Atsushi Ohkubo

The city of Tokyo is plagued by a deadly phenomenon: spontaneous human combustion! Luckily, a special team is there to quench the inferno: The Fire Force! The fire soldiers at Special Fire Cathedral 8 are about to get a unique addition. Enter Shinra, a boy who possesses the power to run at the speed of a rocket, leaving behind the famous "devil's footprints" (and destroying his shoes in the process). Can Shinra and his colleagues discover the source of this strange epidemic before the city burns to ashes?

"I'm pleasantly surprised to find modern shojo using cross-dressing as a dramatic device to deliver social commentary... Recommended."

-Otaku USA Magazine



The prince in his dark days

By Hico Yamanaka

A drunkard for a father, a household of poverty... For 17-year-old Atsuko, misfortune is all she knows and believes in. Until one day, a chance encounter with Itaru—the wealthy heir of a huge corporation—changes everything. The two look identical, uncannily so. When Itaru curiously goes missing, Atsuko is roped into being his stand-in. There, in his shoes, Atsuko must parade like a prince in a palace. She encounters many new experiences, but at what cost...?

"Parasyte fans should get a kick out of the chance to revisit Iwaaki's weird, violent, strangely affecting universe. Recommended." - Otaku USA Magazine

"A great anthology containing an excellent variety of genres and styles." - Manga Bookshelf

Based on the critically acclaimed classic horror manga

The first new *Parasyte* manga in
over 20 years!

NEO PARASYTE

BY ASUMIKO NAKAMURA, EMA TOYAMA, MIKI RINNO, LALAKO KOJIMA, KAORI YUKI,
BANKO KUZE, YUUKI OBATA, KASHIO, YUI KUROE, ASIA WATANABE, MIKIMAKI,
HIKARU SURUGA, HAJIME SHINJO, RENJURO KINDAICHI, AND YURI NARUSHIMA

A collection of chilling new *Parasyte* stories from Japan's top shojo artists!

Parasites: shape-shifting aliens whose only purpose is to assimilate with and consume the human race... but do these monsters have a different side? A parasite becomes a prince to save his romance-obsessed female host from a dangerous stalker. Another hosts a cooking show, in which the real monsters are revealed. These and 13 more stories, from some of the greatest shojo manga artists alive today, together make up a chilling, funny, and entertaining tribute to one of manga's horror classics!

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KC
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COMICS



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*New action series from Takei Hiroyuki, creator of
the classic shonen franchise Shaman King!*

In medieval Japan, a bell hanging on the collar is a sign that a cat has a master. Norachiyo's bell hangs from his katana sheath, but he is nonetheless a stray — a ronin. This one-eyed cat samurai travels across a dishonest world, cutting through pretense and deception with his blade.

Nekogataro

STRAY CAT
SAMURAI

By
Hiroyuki Takei





KODANSHA
COMICS

DEVIL SURVIVOR

AFTER DEMONS BREAK THROUGH INTO THE HUMAN WORLD, TOKYO MUST BE QUARANTINED. WITHOUT POWER AND STUCK IN A SUPERNATURAL WARZONE, 17-YEAR-OLD KAZUYA HAS ONLY ONE HOPE: HE MUST USE THE "COMP," A DEVICE CREATED BY HIS COUSIN NAOYA CAPABLE OF SUMMONING AND SUBDUING DEMONS, TO DEFEAT THE INVADERS AND TAKE BACK THE CITY.

BASED ON THE POPULAR
VIDEO GAME FRANCHISE BY
ATLUS!

PRaise FOR THE ANIME!

"This series never fails to
put a smile on my face."

-Dramatic Reviews

"A very funny look at what happens when
two strange and strangely well-suited people
try to navigate the thorny path to true love
together."

-Anime News Network



My Little Monster

OPPOSITES ATTRACT...MAYBE?

Haru Yoshida is feared as an unstable and violent "monster." Mizutani Shizuku is a grade-obsessed student with no friends. Fate brings these two together to form the most unlikely pair. Haru firmly believes he's in love with Mizutani and she firmly believes he's insane.

Cells at Work! 4

KODANSHA COMICS Digital Edition

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